Amended Biological Assessment

Deer Valley 4WD Meadow Restoration and Blue Lakes/Meadow Lake Road Maintenance Project

Amador Ranger District, Eldorado National Forest

PROJECT LOCATION:

County: Alpine County, California

Legal Description: Section 30, 25, and 26 T.9 N., R 18 E. and .Section 5, T.8 N., R 19 E.

USGS Quadrangle: Pacific Valley (506C)

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EFFECTS DETERMINATIONS

SPECIES / HABITAT	STATUS	DETERMINATION
Lahontan Cutthroat Trout	Threatened	May affect but is not likely to adversely affect
Sierra Nevada yellow-legged frog	Endangered	May affect but is not likely to adversely affect
Sierra Nevada yellow-legged frog: Critical Habitat	Proposed	Not likely to result in the destruction or adverse modification of proposed critical habitat
Yosemite toad	Threatened	May affect and is likely to adversely affect
Yosemite toad: Critical Habitat	Proposed	Not likely to result in the destruction or adverse modification of proposed critical habitat

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I. INTRODUCTION

The purpose of this Biological Assessment (BA) is to determine the potential effects of the Deer Valley 4WD Meadow Restoration and Blue Lakes / Meadow Lakes Road Maintenance Project on aquatic species of concern; Threatened, Endangered, Proposed, or Candidate (TEPC) species, and Designated and /or Proposed Critical Habitats (Table 1). This document was prepared in accordance to the standards established in the Forest Service Manual direction (FSM 2672.43) and the legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act of 1973. In addition, the following information is provided to comply with statutory requirements to use the best scientific and commercial information available when assessing the risks posed to Listed and /or Proposed species and Designated and/or Proposed Critical Habitat by proposed federal actions.

Species Considered for Analysis

Threatened, Endangered, Proposed, or Candidate Species

Pursuant to Section 7(c) of the Endangered Species Act of 1973 as amended, the U. S. Fish and Wildlife Service (USFWS) website was accessed to obtain a current list of TEPC species that may be present on the Eldorado National Forest (ENF) in the vicinity of the project area. An Official Quad Lists covering the Pacific Valley U.S.G.S 7 ½ minute quadrangle was obtained from the Sacramento U.S. Fish and Wildlife Office website on April 7, 2015 (Document 150407083742) (Appendix A). This USFWS list was used as a basis for determining which species should be considered in this BA (Table 1).

All of the TECP species listed in Table 1 were considered for analysis because the Deer Valley 4WD Meadow Restoration and Blue Lakes/Meadow Lake Road Maintenance Project area is located within the geographic and elevation range of these species or their Proposed Critical Habitat.

Table 1. Threatened, Endangered, Proposed or Candidate aquatic species and Proposed Critical Habitat occurring within the local geographic and elevation range of the project area.

Species	Status	Elevation Range	Within Local Range, Geographic or Elevation?	Presence		General and/or specific life stage habitat requirements[a]	Is Habitat Present Within:	
				Project Area?	One Mile?		Project Area?	One Mile?
Lahontan Cutthroat Trout (*Oncorhynchus clarki henshawi*l	T	NA	G = Y E = Y	Y	Y	General: 1,2,3	Y	Y
Sierra Nevada yellow-legged frog (*Rana sierrae*)	E	Above 1,372 m (4,500 ft.)	G = Y E = Y	N	Y	Breeding: 3bc, 4 General: 3bc, 4	Y	Y
Proposed Critical Habitat: Sierra Nevada yellow-legged frog (*Rana sierrae**)*	P	Above 1,372 m (4,500 ft.)	G = Y E = Y	Y	Y	Principle Component Elements (PCEs)[b]	Y	Y
Yosemite Toad (*Anaxyrus canorus)*	T	Above 1,950 m (6,500 ft.)	G = Y E = Y	Y	Y	Breeding: 5 Non-Breeding: 6	Y	Y
Proposed Critical Habitat Yosemite Toad (*Anaxyrus canorus)*	P	Above 1,950 m (6,500 ft.)	G = Y E = Y	Y	Y	Principle Component Elements (PCEs)[b]	Y	Y

[a]= Habitats: 1 – cold-water habitat (large terminal alkaline lakes, alpine lakes, slow meandering rivers, mountain rivers, and small headwater tributary streams); 2 – cool flowing water with available cover of well vegetated and stable banks; 3 – silt free, rocky riffle-run areas; 3 – Perennial stream or water (a – large stream, >4th order; b – medium stream, 2nd – 4th order; c - small/headwater stream, 1st order); 4 – Permanent/Semi-permanent Pond; 5 – Wet Meadow; 6- Upland area surrounding aquatic / breeding features;
[b] = (USDI 2013a)

II. CONSULTATION HISTORY

June 8, 2015	The Forest Service requested formal Consultation with the USFWS on the Deer Valley 4WD Meadow Restoration and Blue Lakes/Meadow Lake Road Maintenance Project (Crabtree 2015, Lipton 2015)
June 2015	The Forest Service and the USFWS met in the field to discuss the project
December 10, 2015	The Forest Service and the USFWS met at the Sacramento field office to discuss the project.
January 6, 2016	The Forest Service and the USFWS discussed the project at the CA/NV Amphibian Population Task Force 2016 Meeting in Davis, CA
March, 7, 2016	The Forest Service and the USFWS discussed the project
July 1, 2015 - March 2016	Numerous email and phone conversations and messages exchanged between the Forest Service and the USFWS concerning the Deer Valley 4WD Meadow Restoration and Blue Lakes/Meadow Lake Road Maintenance Project

III. DESCRIPTION OF THE PROPOSED PROJECT

The purpose of this project is to implement the necessary corrective measures to bring Route 09N01 into compliance with S&G 100 and to implement restorative actions to limit resource impacts along 19E01.

Proposed Actions

Deer Valley 4WD Trail (19E01):

- **Re-open Route 19E01 (Figure 1)**: Add the portion of the Deer Valley 4wd Trail (19E01) that is currently closed back to the MVUM and re-open it to public use. Adding 19E01 to the MVUM is not contingent on the completion of the proposed corrective actions at meadows 09N83-2 or 09N83-1 since evaluation found the route to be consistent with S&G 100.
- **Trail Re-route (Figure 1)**: A short reroute (< 500 feet) of 19E01 (Deer Valley 4WD Trail) on the west side of Deer Creek would be completed in order to move the trail away from areas of active stream bank erosion while improving the angle of approach to the existing stream crossing. The new trail would be located approximately 100 feet west of the existing trail and would require the removal of approximately 20 trees (5 trees >20 inch DBH) and stumps to clear a new trail corridor. Material generated from construction of the reroute (wood chips and logs) would be used to block dispersed areas, define a new trail, and apply mulch to the old trail corridor. The old roadbed would be planted with locally collected vegetation.
- **Harden Stream Crossing at Meadow 09N83-2 (Figure 1, Point V1)**: Native rock, cobble and boulders (8-16" diameter) from the trail or the Clover Valley sediment field would be imported to harden the approaches to Deer Creek. Most of the rock that will be used for hardening the crossing will be moved by jeeps and volunteers and will be sourced from the southern portion of the trail. The stream crossing would also be delineated with boulders to limit the width of the crossing at both sides of Deer Creek. Depending on the level of volunteer participation, the hardening of the stream crossing and route delineation would be completed in 2 – 7 days.

- **Stream Bank Restoration (Figure 1, Points V2 – V5)**: Stream banks impacted by past off-trail vehicle travel would be restored using revegetation methods such as seeding, willow cuttings, and transplanting sod plugs at Deer Valley (09N83-2) and Clover Valley (09N83-1) meadows.

Blue Lakes / Meadow Lake Road (09N01):

- **Re-Open Route 09N01 (Figure 1)**: Add the portion of Blue Lake/Meadow Lake Road (09N01) that is currently closed back to the MVUM and re-open it to public use after the corrective actions (road maintenance activities described below) have occurred to restore hydrologic connectivity.
- **Road Maintenance (Figure 1):** Maintaining/installing catch basins at culverts, new culverts where needed and gravel on the steep sections of the roadway, repairing rolling dips, re-grading the road, and clearing out/ upgrading undersized culverts within the specified alignment and grade tolerances. Ground disturbance would be kept within approximately 25 ft. of the road centerline.

Both Routes (19E01 and 09N01)

- **Seasonal Closure (Forest Order):**

In order to mitigate the potential impacts that re-opening the currently closed portions of Routes 19E01 and 09N01 would have on YOTO, a seasonal closure would be implemented.

This seasonal closure would affect the portions of Routes 19E01 and 09N01 currently closed under the Travel Management SEIS and the northern portion of Route 19E01 between the Trailhead and Clover Valley (not currently closed under the Travel Management SEIS) (Figure 1). The timing of the seasonal closure would be annually variable. The season of use date would be determined annually by the water content (WC) levels (available remotely) at the Blue Lakes (BLK) California Data Exchange Center (CDEC) Weather Station / Active Snow Sensor[1].

Routes 19E01 and 09N01 would remain closed from Jan 1st to 6 weeks post "snowmelt". "Snowmelt" would be indicated by a WC reading of less than or equal to 1.0 inch. If WC readings increase due to late season storms to greater than 1.0 inch after values have dipped below the 1.0-inch threshold, the calculation of 6 weeks post snowmelt would be reset, and the closure duration would be re-initiated / extended. Historically (2005-2014), had the proposed seasonal closure been in effect, it would have been lifted between June 24 and August 20.

Other Actions:

Seasonal closure information (i.e. status), signs and maps displaying the closure areas would be placed at each 19E01 trailhead, and 0.25 miles north of the ENF and STF boundary along route 19E01. Additional signage and a gate would be installed west of Twin Lake on Route 09N01 to help enforce the closure period[2]. Seasonal closure information would also be available on the Eldorado National Forest website, and at the Amador District Office.

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[1] The BLK sensor is located at Lower Blue Lake (8,000 feet) and operated by the Natural Resource Conservation Service (NRCS) (Figure 1)

[2] No gates would be installed at either end of Route 19E01 because no suitable locations were identified. The open terrain, remoteness of the trail, and types of vehicles typically driven along the trail, would allow vehicles to circumvent a physical closure and render a gate an ineffective means of enforcement. The Forest is aware that use is occurring on closed portions of the trail and will continue to utilize multiple methods reduce illicit use during the seasonal closure. The Forest Service increased staffing on the trail in 2015 and the Forest Service will maintain an increased presence in the future to enforce the proposed seasonal closure. Continued Forest Service presence on the trail; coupled with public outreach, signage, and volunteer enforcement are expected to achieve the greatest level of compliance with the proposed seasonal closure.

IV. CONSERVATION MEASURES AND PROJECT DESIGN CRITERIA

Conservation Measures

The following conservation measures are intended to avoid, and minimize, the effects of the Deer Valley 4WD Meadow Restoration and Blue Lakes/Meadow Lake Road Maintenance Project on SNYLF and YOTO. The Conservation Measures are the Standard and Guides (S&Gs) in the 2004 Sierra Nevada Forest Plan Amendment Record of Decision, and the Region 5 Best Management Practices (BMPs) (USFS 2001b, 2004). These measures are derived from the S&Gs and BMPs that were rewritten for clarification and to more directly show their application to the SNYLF and YOTO in the 2014 Programmatic BO (USDI 2014). The intent is to reflect the original S&Gs and BMPs.

The Forest Service will implement the following Conservation Measures (USDI 2014) when implementing the proposed actions:

- Wheeled vehicles off designated routes, trails, and limited off-highway (OHV) use will be prohibited to reduce the risk of crushing, injuring, or disturbing individuals of the listed species (per S&G 69).
- Within occupied habitats or areas proposed as Critical Habitat, mitigation measures to avoid impacts to SNYLF and YOTO will be implemented for ground disturbing equipment to reduce the risk of killing individuals and adversely affecting their habitat (per S&G 109). The measures may include avoiding the activity all together.
- The use of low velocity water pumps and screening devices (*a drafting box measuring 2 feet on all sides covered in a maximum of 0.25 inch screening*)for pumps (per S&G 110) will be utilized during drafting for project treatments to prevent mortality of eggs, tadpoles, juveniles, and adult SNYLF and YOTO.
- Fuels and other toxic materials will be stored outside of riparian conservation areas (per S&G 99) to limit the exposure of the listed species to the toxic materials associated with vegetation management activities.
- If management activities are proposed in a CAR or RCA, site-specific mitigation measures will be designed to (1) minimize risk of sediment entry into aquatic systems and (2) minimize impacts to habitat for aquatic- and riparian-dependent species (per S&G 92).
- When a project results in riparian vegetation being outside the range of natural variability to an extent that SNYLF and YOTO and/or their habitats may be negatively affected, design criteria will be incorporated to mitigate effects or restore riparian vegetation to the natural range of variability during project implementation (per S&G 105).
- Management activities will not adversely affect water temperatures required for local species, including SNYLF and YOTO (per S&G 96).
- For projects that could adversely affect streams to the extent that SNYLF or YOTO and/or their habitats may be negative affected, and the streams are already outside the range of natural variability, mitigation measures and short-term restoration actions will be implemented to prevent declines and/or improve conditions. Long-term restoration actions will be evaluated and implemented according to priority (per S&G 102), which includes adverse impacts to listed species.
- Culverts and stream crossings will not create barriers except for the benefit of SNYLF and YOTO. Water drafting sites will be located to avoid adverse effects to instream

flows and depletion of pool habitat. Where possible, maintain and restore timing, variability and duration of floodplain inundation and water table elevation in meadows, wetlands, and other special aquatic features (per S&G 101).

- Corrective actions will be implemented when needed to restore hydrologic connectivity of aquatic systems that are disrupted by roads (per S&G 100).
- Actions consistent with S&Gs and the desired conditions of aquatic habitats will be implemented after identifying and evaluating adverse effects of recreation-associated activities (per S&G 116).
- Protection needs will be established with appropriate restrictions and mapped prior to commencement of operations (per BMP 1.4). This includes wetlands, meadows, lakes, springs, stream course protection zone widths, etc.
- A limited operating period may be established to ensure that negative impacts to resources may be avoided; contract provisions can also be used to close down operations during adverse operating conditions (per BMP 1.5)
- Soil erosion will be minimized to protect water quality via the stabilizing influence of vegetation foliage and root networks. Surface-disturbed areas will be revegetated with grass or browse species between previously planted trees as needed for control of overland runoff and to meet wildlife needs (per BMP 5.4).
- High-erosion hazard areas will be identified pre-project to adjust treatment measures and prevent downstream water-quality degradation (per BMP 1.3).
- Use of mechanized equipment will be prohibited from sensitive areas in meadows, wetlands, Streamside Management Zones, and landslide areas (per BMP 1.22, per BMP 1.8, and per BMP 1.1).
- Watersheds will be restored to repair degraded watershed conditions and improve water quality and soil stability. Watershed restoration is a corrective measure to improve ground cover density; improve infiltration; prevent excessive overland runoff and conserve the soil resource; stabilize stream banks and stream channels; improve soil productivity; reduce flood occurrence and flood damage; and improve overall watershed function (per BMP 7.1)
- Tractor operations will be limited in wetlands and meadows. In order to limit turbidity and sediment production resulting from compaction, rutting, runoff concentration, and subsequent erosion, the use of mechanical equipment will be excluded in wetland and meadows except for the purpose of restoring wetland and meadow functions. Sediment and other pollutants will be controlled from entering streamcourses. The application of this BMP will be mandatory on all vegetation-manipulation projects as prescribed in the environmental documentation (per BMP 5.3). Specific protection measures will be established for each area that could incur adverse water-quality impacts (per BMP 1.18).
- Adverse water-quality impacts associated with destruction, disturbance, or modification of wetlands will be avoided (per BMP 7.3). Factors that will be evaluated include, but are not limited to, water supply, water quality, recharge areas, functioning of the wetland during flood and storm events, flora and fauna, habitat diversity and stability, and hydrologic function of riparian areas.
- A water quality monitoring plan will be part of this Project's EA to evaluate the implementation and effectiveness of a management prescription in protecting water quality (per BMP 7.6).

- Management by closure to seasonal, temporary, and permanent use will be used to exclude activities that could result in damages to either resources or improvements, including impaired water quality from roads and trails (per BMP 7.7). Closure to use will occur when the condition of the watershed must be protected to preclude adverse water-quality effects and adverse impacts to the listed amphibians (per BMP 1.5; per BMP 2.9).
- The Forest Service will minimize water, aquatic, and riparian resource disturbances that may affect SNYLF and YOTO when constructing, reconstructing, or maintaining temporary and permanent water crossings (BMP 2.8). Specifications for stream crossing areas and design, construction/reconstruction of permanent and temporary crossings, as well as maintenance of these crossings included in 36 technical specifications listed in BMP 2.8 will be followed.
- Measures described in BMP 2.11 to prevent adverse effects from fuels, lubricants, cleaners, and other harmful materials that are 1) discharged into nearby surface waters or 2) infiltrated through soils to contaminate groundwater resources on skin-respiring amphibians resulting from equipment refueling and servicing will be implemented.
- To protect water quality during road maintenance and operations, 31 practices related to road inspection, maintenance planning, and operations will be implemented as appropriate based on local site conditions (per BMP 2.4).
- A project-specific erosion control plan will be developed to effectively limit and mitigate erosion and sedimentation from any ground-disturbing activities, through planning prior to commencement of project activity, and through project management and administration during project implementation (per BMP 2.13)
- The effects to riparian and aquatic resources of creating, maintaining and using routes and areas for motorized off-highway vehicles (OHV) will be mitigated by OHV-specific BMPs designed for each individual project or batch.
- OHV trails will be located to reduce the risk that sediment originating from designated trails and areas will enter watercourses and water bodies to minimize hydrologic connectivity, and by incorporating drainage structures into trail design to disperse concentrated runoff (per BMP 4.7.2).
- The discharge of sediment into water bodies from OHV use will be minimized or prevented by implementing the appropriate techniques outlined in BMP 4.7.3 for crossing location, trail approaches to watercourses, and design and construction of watercourse crossings.
- The discharge of sediment into water bodies will be minimized or prevented during construction, reconstruction, and realignment of OHV trails (per BMP 4.7.4).
- The discharge of sediment into watercourses and water bodies will be minimized or prevented by permanently restoring OHV-damaged areas, watercourse crossings, and OHV trails no longer designated for use (per BMP 4.7.8).
- The discharge of sediment into watercourses and water bodies will be minimized or prevented by permanently restoring OHV-damaged areas, watercourse crossings, and OHV trails no longer designated for use (per BMP 4.7.8).
- Each SNYLF or YOTO encountered shall be treated on a case-by-case basis, but the general procedure that would be followed is as follows; 1) Leave the non-injured animal

alone if it is not in danger; or 2) Move the animal to a nearby safe location if it is in danger. These two actions are further described below.

- When a YOTO is encountered within the project site, the first priority is to stop all activities in the surrounding area that may have the potential to result in the harassment, injury, or death of the individual. Then, the situation shall be assessed by a FS biologist or Service-approved biologist in order to select a course of action that will minimize adverse effects to the individual.
- Avoidance is the preferred option in an individual YOTO is not moving or is found using a burrow or other refugia. A FS biologist or Service-approved biologist shall inspect the animal and the area to evaluate the necessity of fencing, signage, or other measures to protect the animal.
- If appropriate, the YOTO shall be allowed to move out of the hazardous situation on their own volition to a safe location. An animal shall not be picked up and moved based on it not moving fast enough or it is an inconvenience for activities associated with project operations.
- Individual YOTO shall be captured and moved by hand only when it is necessary to prevent harassment, injury, or death. If suitable habitat is located immediately adjacent to the capture location, then the preferred option is relocation to that site. An individual shall not be moved outside of the radius it would have traveled on its own. Under no circumstance shall they be relocated to a non-FS property without the landowner's written permission.
- Only FS biologists or Service-approved biologists may capture YOTO. Nets or bare hands may be used to capture the animals. Soaps, oils, creams, lotions, repellants, or solvents of any sort cannot be used on hands within two hours of handling the individuals. If the animal is held for any length of time in captivity, they shall be kept in a cool, dark, moist, environment with proper airflow, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for transporting shall not contain any standing water, or objects, or chemicals that may injure or kill YOTO.
- To avoid transferring disease or pathogens between suitable habitats during the course of trans-locating the YOTO, FS biologists or the Service-approved biologist shall use the following guidance for disinfecting equipment and clothing (http://www.open.ac.uk/daptf/:)

Design Criteria

In addition to the Conservation Measures listed above, separate Design Criteria were also developed to reduce the effects of the proposed actions on LCT, SNYLF and YOTO. These additional Design Criteria include:

- The efficacy and accuracy of the snow sensor at Blue Lake for indicating snow melt conditions in the project area will be assessed by FS biologists and other qualified staff during the first few seasons of implementing the seasonal closure. Field verification of snow melt and trail condition will occur prior to lifting the seasonal closure.
- In the event that the Blue Lakes snow sensor is not functioning, FS staff would attempt to verify snow condition at Blue Lakes and/or within the suitable habitat in the vicinity of 19E01 and 09N01during spring snowmelt. Routes 19E01 and 09N01 would remained closed until snowmelt is confirmed, or the timing of snowmelt assessed,

- To limit impacts to YOTO and SNYLF, the use of ground-based mechanized / motorized vehicles or equipment to implement the restoration activities would not occur during the proposed seasonal closure for Routes 19E01 and 09N01.
- Restoration activities associated with Deer Creek and the unnamed perennial stream between Meadow Lake and Twin Lake would be completed during a period of low streamflow. This typically occurs in late summer and early fall. The project Hydrologist will be consulted before implementation of work along 09N01 and 19E01 to ensure that streamflow is low enough for road maintenance and restoration activities to occur.
- Restoration activities associated with Deer Valley 4WD Trail (19E01) and Blue Lake / Meadow Lake Road (09N01) would be monitored for efficacy as outlined in the Eldorado National Forest Travel Management SEIS Settlement Agreement Monitoring plan (2015).
- All equipment would avoid traveling off the hardened road surface (i.e. outside of the route footprint) or crossing into aquatic habitat *to the extent possible* during restoration activities associated with the hardening of the approaches at Route 19E01's stream crossing at Deer Creek (in Meadow 9N83-2) and the culvert installation, repair, and maintenance on Route 09N01. Aquatic habitat includes the portion of Route 19E01 that crosses directly through Deer Creek.
- Where equipment travels off the hardened road surface or crosses through stream habitat for restoration work (such as the re-route) these areas shall be surveyed for existing LCT, YOTO, and SNYLF by qualified FS personnel just prior to starting work to avoid crushing.
    - Qualified personnel (i.e. biologist) will remain on-site during implementation of all of the proposed restoration and maintenance actions.
    - If LCT are found in Meadow, Blue, or Deer Creek, their safety shall be assessed by the on-site biologist the USFWS will be notified of the occupancy detection.
    - Since YOTO have been found to have site fidelity to burrows, extra attention will be given to identify existing burrows during the survey. Burrows will be avoided where possible.

IV. STATUS OF THE SPECIES AND ENVIRONMENTAL BASELINE

Lahontan Cutthroat Trout

The Lahontan Cutthroat Trout (LCT), a federally listed Threatened species, is native to drainages in the eastern Sierra. The LCT historically occurred in a wide variety of stream and lake habitats, ranging from terminal alkaline lakes, such as Pyramid and Walker Lakes, to the clear alpine waters of Lake Tahoe and Independence Lake. They were found in large, low gradient rivers, moderate gradient streams, and small, headwater tributary streams. They are most plentiful in well-vegetated cold-water streams with abundant cover and in large lakes. They feed primarily on terrestrial and aquatic invertebrates, but large individuals often feed on juvenile fish. Spawning takes place in streams from April to July depending on stream flows, water temperatures, and elevation.

Introduced rainbow, brook, and brown trout have replaced the LCT in most of its native range. Overharvesting, degraded habitats, and competition with introduced trout species are some of the factors that have led to the extirpation of these trout from their native waters. Other major threats to LCT migration barriers, decreased or regulated stream flows, and small isolated populations. Currently, none of the naturally occurring populations are inter-connected so maintaining genetic

diversity is at risk. There is only one self-sustaining wild lake population of LCT in California, located in Independence Lake.

In an effort to provide angling opportunities for the LCT while aiding in their recovery, the California Department of Fish and Wildlife (CDFW) have been, and continue to stock LCT in accessible higher elevation lakes throughout California, including the Eldorado National Forest. Six of these stocked lakes are located within the vicinity of the Deer Valley 4WD Meadow Restoration and Blue Lakes / Meadow Lake Road Restoration Project area; Upper Blue Lake, Lower Blue Lake, Granite Lake, Evergreen Lake, Twin Lake, and Meadow Lake (Figure 2 and Table 2). Although the last documented stocking event occurred in 2013 (Table 2), stocking also occurred in 2014 and 2015 (USFWS Chad Mellison, Personal Communication, April 8, 2015). Therefore, for analysis purposes, it is assumed these lakes all contain LCT and will continue to contain LCT through future stocking efforts.

Table 2: Lahontan Cutthroat Trout lake stocking and presence within the vicinity of the project area.

Location	Survey Data	Lifestages	Obs. Method	Protocol Type
Granite Lake	6/29/2001	Adult	Net	CDFW High Lakes Inventory & Monitoring / CDFW Fish Stocking
Evergreen Lake	7//8/2001	Adult	Other	CDFW High Lakes Inventory & Monitoring / CDFW Fish Stocking
Granite Lake	9/13/2012	Adult	Net	CDFW Fish Stocking
Evergreen Lake	9/13/2012 and 9/12/2013	Parr	Other	CDFW Fish Stocking
Lower Blue Lake	9/13/2012 and 9/12/2013	Parr	Other	CDFW Fish Stocking
Meadow Lake	9/13/2012 and 9/12/2013	Parr	Other	CDFW Fish Stocking
Twin Lake	9/13/2012 and 9/12/2013	Parr	Other	CDFW Fish Stocking
Upper Blue Lake	9/13/2012 and 9/12/2013	Parr	Other	CDFW Fish Stocking

Other than the known occupancy summarized in Table 2, LCT have never been detected in Blue Creek, Meadow Creek between Meadow Lake and Twin Lake, or Deer Creek). Detections of "salmonids" and other trout have, however, been confirmed in Meadow, Blue, and Deer Creeks (Tables 2b and 2c). The location of these surveys are displayed in Figures 2b and 2c. The nearest LCT detected (other than those found in the stocked lakes) occur outside of the project area in Meadow Creek, below the Meadow Lake dam (Table 2c and Figure 2c). These LCT are physically isolated from the project area by the Meadow Lake dam and are not at risk of being disturbed or impacted by the proposed project activities.

Table 2b. Surveys of aquatic features and fish presence in the vicinity of the project area. Survey locations (Figure 2b).

Survey Location	Name	Survey Data	Protocol Type	Fish Species
Crossing 0901	Meadow Crk	6/10/2014	ENF Travel Management	"Salmonids"
Crossing 09N01_1	Meadow Crk	6/10/2014	ENF Travel Management	None
Crossing 09N01_2	Meadow Crk	6/10/2014	ENF Travel Management	None
Crossing_19E01_9N83	Blue Creek	6/17/2014	ENF Travel Management	"Salmonids"
Crossing_19E01_9N83-2	Deer Creek	6/17/2014	ENF Travel Management	"Salmonids"
Crossing 19E01_Pond	-	6/17/2014	ENF Travel Management	None
PGEMOKE_Efish_Blue1	Blue Creek	9/13/2007	Multi-pass Electro-fish	Speckled Dace; Rainbow Trout; Lahontan Redside minnow; Tahoe sucker; Brook Trout
		9/8/2008	Multi-pass Electro-fish	Lahontan Redside minnow; Rainbow Trout; Brook Trout; Speckled Dace; Tahoe sucker; tui chub
PGEMOKE_Efish_Blue2a	Blue Creek	9/25/2007	Multi-pass Electro-fish	Rainbow Trout; Brook Trout; Lahontan Redside minnow
		9/10/2008	Multi-pass Electro-fish	Brook Trout
PGEMOKE_Efish_Deer1	Deer Creek	9/12/2007	Multi-pass Electro-fish	Rainbow Trout; Brook Trout
		9/15/2008	Multi-pass Electro-fish	Brook Trout

Survey Location	Name	Survey Data	Protocol Type	Fish Species
PGEMOKE_EfishSnorkel_ Blue2b	Blue Creek	9/27/2007	Multi-pass Electro-fish	Brook Trout; Rainbow Trout; Tahoe sucker
		9/11/2008	Multi-pass Electro-fish	Brook Trout; rainbow; Tahoe sucker;
PGEMOKE_EfishSnorkel_ Blue2b-FERC	Blue Creek	9/12/2007	FERC Snorkel	Brook Trout; Rainbow Trout; Speckled Dace; Tahoe sucker
		9/10/2008	FERC Snorkel	Tahoe sucker; brook trout; rainbow trout
HERP	Meadow Crk	7/29/1992	VES	None
HERP	Blue Creek	7/16/2003	VES	None
HERP	Blue Creek	7/2/2001	VES	None
HERP	Blue Creek	7/2/2001	VES	None
HERP	Meadow Crk	7/28/1992	VES	None
HERP	Mdw 9N83	7/2/2001	VES	None
HERP	Twin Lake	6/12/2013	VES	None
Herp_DeerValley	Deer Creek	08/27/2014	VES	None
Herp_DeerValley_B	Deer Creek	08/27/2014	VES	None

Table 2c: Mokelumne River Project FERC Project No. 137 Population Monitoring Results (PG&E). Survey locations are mapped in Figure 2c.

Survey Location	Name	Survey Data	Protocol Type	Fish Species
Blue Creek between Upper and Lower Blue Lakes	BLUE1	1999, 2007, 2008, 2009	Multi-pass Electrofishing	Brook Trout, Rainbow Trout
		2014		Brook Trout
		2015		Brook Trout and Rainbow Trout
Blue Creek(below Lower Blue Lake	BLUE2a	2007	Multi-pass Electrofishing	Brook Trout and Rainbow Trout
		2008		Brook Trout
		2009		Brook Trout, Rainbow Trout, and Brown Trout
		2014 & 2015		Brook Trout
Blue Creek above Deer Creek	BLUE2b	1999, 2007, 2008, 2009, 2014, & 2015	Multi-pass Electrofishing	Brook Trout and Rainbow Trout
Deer Creek above Blue Creek	DEER1	1999, 2007, 2008, 2009, 2014, & 2015	Multi-pass Electrofishing	Brook Trout and Rainbow Trout
Meadow Creek between Twin Lake and Meadow Lake	MEAD1	1999	Multi-pass Electrofishing	Brook Trout
Meadow Creek below Meadow Lake (**outside of project area****)	MEAD2	1999	Multi-pass Electrofishing	Brook Trout and Lahontan Cutthroat Trout
		2007, 2008		Brook Trout
		2009		Brook Trout and Rainbow Trout
		2014 & 2015		Brook Trout and Lahontan Cutthroat Trout

**MEAD2 is outside of project area and would not be affected by the proposed project activities.

Status of the Habitat / Existing Condition in the Project Area

Lake dwelling LCT require stream habitat to spawn and often make extensive spawning migrations upstream. Suitable spawning stream habitat is lacking in the project area. Optimal stream habitat is characterized by clear, cold water with silt-free substrate, equal amounts of pools and riffles, and relatively stable *unregulated* stream flows. If the LCT stocked in the lakes in the vicinity of the project area were to breed (although there is no evidence that they are self-sustaining), the offspring of these LCT would be confined to the lakes and/or short distances of streams with *regulated* flows, isolated from LCT located in other nearby aquatic systems. Population isolation eliminates the ability to genetically diversify and further threatens LCT persistence.

Meadow Creek is not a naturally flowing creek. Meadow Creek is a flow thru system originating from Twin Lake and flowing into Meadow Lake. Meadow Lake is a regulated reservoir with a dam on the western edge. "Populations" added to Meadow Lake are confined to the lake and the

approximately 1.2 mile reach of Meadow Creek, between Meadow Lake and Twin Lake, but would not be able to freely enter into Twin Lake. The dam on the western end of Twin Lake would interrupt a LCT migration. Flows are decreased and regulated by the Twin Lake dam. Similarly, LCT stocked into Twin Lake are isolated from Meadow Creek and Meadow Lake by a dam at the western edge of Twin Lake.

Twin Lake LCT could however, to move into Blue Creek and eventually Deer Creek via Blue Creek. Route 19E01 has stream crossings on both Blue Creek and Deer Creek within the portion of the route currently closed to public motorized wheeled travel.

Sierra Nevada Yellow-Legged Frog

The Sierra Nevada yellow-legged frog (SNYLF) inhabits high elevation lakes, ponds, marshes, meadows, tarns, and streams. They are highly aquatic at all lifestages and are more commonly associated with deep water habitats (greater than 2 meters or 6.5 feet) that lack introduced fish. While the frog populations show a positive correlation with deep water habitats (Knapp 2005), both tadpoles and adults are most commonly found along open, gently sloping shorelines that provide shallow waters of only 5 to 8 centimeters (2 to 3 inches) in depth (Mullally and Cunningham 1956, Jennings and Hayes 1994, USDI 2013a).

At lower elevations within their historical range, the frog is associated with rocky streams and wet meadows surrounded by coniferous forests (Zweifel 1955). Streams utilized by adults vary from high gradients with numerous pools, rapids, and small waterfalls, to streams with low gradients and slow flows, marshy edges, and sod banks (Zweifel 1955). Aquatic substrates vary from bedrock to fine sand, rubble rock fragments, and boulders (Zweifel 1955). The SNYLF is rarely found exclusively in small or ephemeral streams which typically lack sufficient depth and hydroperiods for adequate refuge and overwintering habitat (Jennings and Hayes 1994). However, these small streams at lower elevations locally provide suitable habitat for post-metamorphic life stages, especially when they maintain permanent water.

The timing of breeding varies annually, but occurs shortly after snowmelt and typically between May and July. Females lay clutches varying from 15 to 350 eggs per mass (Vredenburg et al. 2005) attached to rocks, gravel, and vegetation or under banks (Pope 1999). Eggs hatch in about 2.5 to 3 weeks (Pope 1999). Tadpoles often require 2 to 4 years to reach metamorphosis (Bradford et al. 1993, Knapp and Matthews 2000) depending on local climate conditions and site-specific variables. In high mountain lakes, adult frogs typically move only a few hundred meters (Pope 1999), but single-season distances of up to 3.3 kilometers (2.05 miles) have been recorded along streams (Wengert 2008). It should be noted however, that there is some concern that the frogs studied by Wengert (2008) were actually Foothill Yellow-Legged Frogs (FYLF). Adults may move between selected breeding, feeding, and overwintering habitats during the course of the year. Though typically found near water, occasional overland movements by adults of over 66 meters (217 feet) have been recorded (Pope 1999). The farthest reported movement distance from water is 400 meters (1,300 feet) (USDI 2013a).

SNYLF has been found throughout the Eldorado National Forest at elevations between 5,187 feet and 8,986 feet in records dating as far back as 1939. Surveys have recorded detections in streams, streams or potholes in meadows, and lakes. The highest frequencies of SNYLF occurrences on the ENF occur in high elevation lake habitats. The Deer Valley 4WD Meadow Restoration and Blue Lakes / Meadow Lake Road Maintenance Project lies within the known elevation range of the SNYLF on the ENF.

In 2003, and between 2011 and 2014, USFS visual encounter surveys (VES) were performed along travel Routes 19E01 and 09N01. Any wet meadow and other wet aquatic features (i.e. streams, seeps, and springs) within 100 meters (upstream and downstream) of the travel routes

were surveyed. No SNYLF were detected during VES conducted in the aquatic features and meadows associated with routes 19E01 and 09N01 (Table 3).

Table 3: USFWS Surveys of aquatic features and detection results for SNYLF along Routes 19E01 and 09N01.

Route Name	Survey Dates	Survey Results	Nearest Sighting from Travel Route (Figure 3)
Deer Valley 4WD Trail (19E01)	7-16-2003 7-28-2011 10-21-2012 6-17-2014 8-27-2014	None trout trout trout None	SNYLF: 1.9 miles
Meadow Lake Road (9N01)	7-27-2011 9-26-2012 6-10-2014 7-21-2014	None None None trout	SNYLF: 0.8 miles

Other forest-wide survey efforts have detected SNYLF as documented in the FS herpetofauna database AqS. The nearest documented sightings of SNYLF are less than 1 mile north of Route 09N01 in 4 unnamed lakes between Upper Blue Lake and Lower Blue Lake and less than 1 mile west of Meadow Lake in Deadwood Lake and an unnamed intermittent stream originating at Deadwood Lake's outlet (Figure 3). Additional nearby sightings are approximately 2 miles northeast of Route 19E01 in the headwaters of Deer Creek (Figure 3).

Habitat Account

The SNYLF is associated with a variety of aquatic habitats including wet meadows, streams, and lakes (Vredenburg et al. 2005). Highest summer densities and overall total numbers are found in lakes lacking introduced fish, more than 1 meter in depth, and near-shore habitat with warm water temperatures (Matthews and Pope 1999). Deep water habitats (greater than 5.4 feet (1.7 meters)) provide the best opportunity for annual survival of adults and their multi-year tadpoles because complete freezing, very low dissolved oxygen conditions, and regular drying are factors that affect the ability of a water body to support all life stages.

Egg masses are attached to streambed substrates or submergent/emergent vegetation or under banks. Once the embryos develop into tadpoles, the tadpoles utilize shallow, warm water for thermoregulation, foraging, and growth. If disturbed, the tadpoles rapidly retreat from shallow water and hide in deeper water, in mud, under rocks, or in vegetation. As noted earlier, deep water that does not freeze regularly to the bottom of the water body is required to allow the tadpoles to develop to metamorphosis. During the active season (May through October), post-metamorphic individuals use a variety of habitats ranging from shallow snowmelt pools to streams connecting lakes and ponds to deep water lakes. Matthews and Preisler (2010) indicated site fidelity was high among individuals found in breeding, foraging, and overwintering habitats. Dispersal between these sites is not limited to aquatic routes. Although these frogs are often seen within a meter or two of water they can make terrestrial movements between suitable habitats up to one kilometer. Post-metamorphic individuals have been locally observed basking in full sun or on the water's surface, hiding under streambanks, logs, or in herbaceous riparian vegetation, and lying at the bottom of lakes/ponds in deeper water. Adult and subadult frogs likely avoid freezing in the winter by utilizing underwater crevices in deep waters (Matthews and Pope 1999).

SNYLF home range varies throughout the year and by individual. In August, home range can vary from a little under 20 square meters to over 1,000 square meters. Home ranges are largest in September (53 to 9,807 square meters) which likely accounts for foraging movements. By October, home ranges are very small (3.2 to 82 square meters) as frogs settle into overwintering habitat (Matthews and Pope 1999).

Additional information defining suitable habitat has been provided by the Federal Register (2013) and is briefly summarized here. The three essential habitats required by the frog include suitable aquatic breeding, aquatic non-breeding, and upland habitat. Suitable aquatic breeding habitat includes: 1) permanent water bodies (or those connected or close to permanent waters) that are 2) deep enough to prevent freezing in winter, 3) support a natural flow pattern, 4) be free of fish or other introduced predators, 5) regularly maintain water persistence to allow for tadpole development and 6) contain shallow zones, open basking areas, aquatic refugia, and sufficient food resources for tadpoles. Aquatic non-breeding habitats share many of the characteristics breeding habitats do, but they may lack adequate water depth to allow for completion of the species life cycle. Upland habitats include both immediate riparian areas around aquatic habitats (25 meters / 82 feet from the edge of water) and areas between suitable breeding habitats, and watershed-wide areas that provide the quantity and quality of water needed by the frog.

A proportion of suitable habitat in the project area was included in the SNYLF Proposed CH published in the Federal Register (USDI 2013a). In the proposal to designate Critical Habitat (USDI 2013a) the USFWS described the characteristics essential to the conservation of the SNYLF. These characteristics define primary constituent elements (PCEs) of Critical Habitat. The PCEs specific to SNYLF are:

1. Aquatic habitat for breeding and rearing;

    a) Permanent water bodies, that are either hydrologically connected to, or close to, permanent water bodies including lakes, streams, rivers, tarns, creeks, pool, and other aquatic habitats. This habitat must be:
        i. Be of sufficient depth.
        ii. Maintain a natural flow pattern, including periodic flooding, and have functional community dynamics.
        iii. Be free of fish and other predators.
        iv. Maintain water for 2 years during the entire tadpole phase.
        i. Contain bank and pool substrates, shallower lake microhabitat with solar exposure, open gravel banks, aquatic refugia, and sufficient food resources for tadpole growth and development

2. Aquatic non-breeding habitat (including overwintering habitat);

    a) Same characteristics as aquatic breeding and rearing habitat, but may lack adequate water depth to allow for completion of life cycle but provides for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult SNYLF. These habitats also contain:
        i. Overwintering refugee, with microhabitat properties that protect hibernating life stages from winter freezing
        ii. Streams, stream reaches, or wet meadow habitats that can function as corridors for movement between aquatic habitats used as breeding or foraging sites.

3. Upland Areas;
    a) Areas adjacent to or surrounding breeding and nonbreeding aquatic habitat that provide area for feeding and movement of the SNYLF.

i. This extends 25 m (82 ft.) from the bank or shoreline
ii. The canopy overstory should be sufficiently thin and generally not exceed 85% to allow sunlight to reach the aquatic habitat and thereby provide basking areas for the SNYLF.
iii. For areas between proximate (300 m (984 ft.)) water bodies, the upland area extends from the bank or shoreline between such water bodies
iv. Within mesic habitats such as lake and meadow systems, the entire area of continuous or proximate habitat is suitable for dispersal and foraging.

Status of the Habitat / Existing Condition in the Project Area

For the purposes of analysis, potentially suitable SNYLF habitat is defined as any perennial or intermittent stream, meadow, or lake habitat occurring above 4,500 feet. Also included in the definition of suitable habitat is all land within a 25 m (82 ft.) buffer. This habitat buffer is assumed to provide suitable terrestrial habitat. Since the SNYLF is highly aquatic, the potential for impacts beyond the 25m (82 ft.) buffer of suitable habitat is very low and would likely result in negligible effects to the species.

A proportion of the suitable habitat in the project area occurs within Proposed CH (Unit 2F: Squaw Ridge). Because a CH proposal does not signal that habitat outside the proposed area is unimportant or not needed for recovery of the species, the types of potential effects explored during analysis will include suitable habitat both within and outside Proposed CH (Table 4 and Table 9). The term *suitable habitat* will be used throughout the analysis of effects to collectively describe the potential effects to habitat within and outside of Proposed CH.

Suitable SNYLF habitat occurring within 1 mile of Project proposed actions is reported in Table 4 and displayed in Figure 4. The 1-mile buffer was chosen as a way to quantify habitat availability within the vicinity of the project area. There is no ecological relevance to the chosen 1-mile buffer, although it provides a more focal look at the extent of habitat connectivity in the vicinity of the proposed actions.

Table 4. A summary of SNYLF potentially suitable habitat found within 1 mile of the Project Area.

19E01 (Deer Valley 4WD Trail)		
Habitat Type	Acres	Miles
a. SUITABLE HABITAT[a]		
Streams	526.20	22.50
Perennial	255.82	10.48
Intermittent	270.38	9.94
Meadow	213.56	
Lake	16.75	
b. PROPOSED CRITICAL HABITAT[b]		
Streams	150.40	6.89
Perennial	85.36	3.90
Intermittent	65.04	2.99
Meadow	102.12	
Lake	5.61	

09N01 (Blue Lakes / Meadow Lake Road)		
Habitat Type	Acres	Miles
a. SUITABLE HABITAT[a]		
Streams	177.94	8.40
Perennial	92.34	4.33
Intermittent	85.60	4.07
Meadow	358.91	
Lake	422.13	
b. PROPOSED CRITICAL HABITAT[b]		
Streams	168.22	8.01
Perennial	92.34	4.33
Intermittent	75.88	3.68
Meadow	354.73	
Lake	422.13	

[a] = *Suitable Habitat* includes *all* suitable habitat (including Proposed CH). The acres / miles reported under *suitable habitat* are inclusive of those reported under Proposed CH;
[b] = Proposed CH only includes the suitable habitat occurring within the Proposed CH boundary (Figure 4).

Approximately 704 acres / 31 miles of potentially suitable SNYLF stream, 573 acres of meadow, and 439 acres of lake habitat occur within 1 mile of the proposed Deer Valley 4WD Meadow Restoration and Blue Lakes / Meadow Lake Road Maintenance Project actions (Table 4, Figure 4). Of these potentially suitable habitats, Routes 19E01 and 09N01 intersect, or run directly adjacent to 4 perennial streams (Blue Creek, Deer Creek, Meadow Creek between Twin and

Meadow Lake and an unnamed tributary of Deer Creek), 5 unnamed intermittent streams, 5 meadows, and 3 lakes (one unnamed lake adjacent to 19E01, Twin Lake, and Meadow Lake) (Figure 4).

Blue Creek, Deer Creek, and Meadow Creek are all regulated streams. Their flows are controlled by releases from the Lower Blue Lake or Twin Lake reservoirs. Due to this regulation, these streams likely experience lower spring runoff and higher summer and fall stream flows than they would under a naturally occurring hydrograph. Native species such as the SNYLF are adapted to natural hydrograph fluctuations that trigger breeding and non-breeding activity. Thus, the existing altered hydrograph condition, coupled with the presence of non-native fish (rainbow and brook trout), reduce the habitat suitability for SNYLF, and likely explain the current lack of presence in these habitats.

19E01 – Deer Valley 4WD Trail

The Deer Creek 4WD Route travels alongside Blue Creek, adjacent to one unnamed lake, crosses Blue Creek (Figure 5a), Deer Creek (Figure 5b), a perennial tributary to Deer Creek, 4 other unnamed intermittent streams, and intersects 2 meadows (Figure 4). The majority of Route 19E01 travels through a small strip of National Forest land surrounded by the Mokelumne Wilderness. Both Blue Creek and Deer Creek have high stream power. Water releases from Lower Blue Lake increase the flows in Blue Creek and subsequently in Deer Creek (below the confluence of the two creeks). Trout are common in both creeks. Multiple user-created approaches to the stream crossings at Blue Creek and Deer Creek have caused widening of the channel and are contributing to erosion entering the creeks (Figures 5a and 5b). The high flows, trout presence, and erosion reduce the habitat suitability and likelihood of SNYLF presence in this area.

Where Blue Creek meanders through Meadow 09N83-1 (Figure 1), the banks are vertical and very unstable, actively eroding along the entire length of the reach. An active gravel point bar that melds smoothly into the west side terrace dominates the west side of Blue Creek, which is lower in elevation than the east side. This area also contains some dispersed camping sites. The west side dominance of gravel suggests that a severe scour event occurred. The east side of Blue Creek has pockets of sand deposits at Clover Valley (Figure 1), perhaps deposited there during the same scour event that revealed the gravel on the west side. The well-sorted nature of the grains (coarse sand), the complete lack of organics and horizontal strata in the soil, and the very long rooting of sedge in the banks, are evidence that the sand deposited in this area occurred very recently. These signs also indicate that the water table was never very close to the surface of this deposit. Because of the constraint that the tall east banks impose on the stream, this side of the channel has scoured down to exposed clay substrate and in some pools even deeper, and quite old, cobble strata. The east banks will be unstable for some time as the stream regains a floodplain width at the elevation it naturally occupies.

09N01 – Blue Lake / Meadow Lake Road

Route 09N01 travels adjacent to Twin Lake and ends prior to Meadow Lake. It runs adjacent to and then crosses Meadow Creek at one location. Meadow Creek is a flow thru system originating from Twin Lake and flowing into Meadow Lake. Route 09N01 is a wet route that crosses through multiple wet meadow areas. After snowmelt, water flows over the route. Springs above the road feed water to the roadbed during the wet season. Existing culverts at the stream crossings are degraded. Some plugging and filling is occurring in larger culverts where the culvert outlet to flow ratios are impacted because of a lack of gradient, subsequently causing runoff down the road. Other smaller culverts along this route are partially plugged.

Yosemite Toad

Species and Habitat Account

Yosemite toads (*Anaxyrus* [*Bufo*] *canorus*) are endemic to high elevation aquatic habitats in the central Sierra Nevada of California. They occur from the Blue Lakes region north of Ebbetts Pass in Alpine County south to close to the Kings River, at elevations from 1950m to 3600m (6400 to 11,800 ft). Adult males and females are sexually dichromatic; males are uniformly brown or olive-green, while females have distinct gray, brown, and/or rust colored markings. Yosemite toads reach maturity at 3 to 6 years of age and can live for at least 12 years (Kagarise Sherman 1980, Kagarise Sherman and Morton 1984).

Yosemite toads are mainly active diurnally (Karlstrom 1962, Kagarise Sherman 1980) but recent surveys also have found them to be active at night as well (Martin 2008). Adults utilize both aquatic and terrestrial environments for foraging and cover during the breeding and non-breeding seasons and demonstrate high site fidelity. Individuals have been found to use the same breeding ponds from year to year and some use the same daytime refuges in the non-breeding season (Liang 2010, Martin 2008). Yosemite toad tadpoles are grazers, feeding on detritus, algae, and even decaying carrion (Grinnell and Storer 1924). Though diet studies are limited, post-metamorphic toads are known to primarily prey on a variety of terrestrial invertebrates (Grinnell and Storer 1924, Mullaly 1953, Wood 1977). Primary predators of Yosemite toad tadpoles include garter snakes and aquatic invertebrates and primary predators of post-metamorphic toads include garter snakes and a variety of avian species (Kagarise Sherman 1980, Kagarise Sherman and Morton 1993, Karlstrom 1962, Mullaly 1953, Nelson 2008).

The breeding ecology of Yosemite toads has been well-studied. Adult toads arrive at breeding sites at snowmelt (Karlstrom 1962) and breeding generally occurs over a short period of time (as short as a few days; Kagarise Sherman 1980, Sadinski 2004). Males emerge and establish breeding choruses in the spring as soon as snow melts sufficiently to form pools (Kagarise Sherman 1980, Karlstrom 1962). Males tend to arrive synchronously and have been found to remain at breeding sites for 1 to 2 weeks. Males distribute themselves in the breeding area, though they do not defend specific breeding locations and will move around. Females arrive at the breeding area after males and leave before them; they are secretive and hard to find unless in amplexus. Females deposit one egg mass per breeding season and few females deposit eggs every year (Kagarise Sherman 1980). Egg masses may be laid separately, in communal masses or split among multiple locations. Estimates of the number of eggs per mass are 1100 to 2000 eggs per female (Kagarise Sherman 1980, Kagarise Sherman and Morton 1993, Karlstrom 1962). Development is relatively rapid but also depends on water temperatures, with faster development in warmer temperatures. Eggs hatch in 4–15 days and tadpoles metamorphose in 48–63 days (Kagarise Sherman 1980, Karlstrom 1962, Sadinski 2004). Metamorphs (recently transformed young-of-the-year) disperse away from natal pools and may immediately take refuge in upland rodent burrows (Mullally 1953) or overwinter in their natal meadow and move upland in the summer of their second or third year (Kagarise Sherman 1980, Kagarise Sherman and Morton 1993, Martin 2008). In meadows, metamorphs and yearlings appear to be associated with burrows, willows and long sedges and grasses (Martin 2008, Mullally 1953).

Following breeding, most adults disperse into upland habitat and retreat to rodent burrows and other cover making them difficult to detect (Karlstrom 1962, Liang 2010). They may also be found in upslope aquatic habitats such as headwater springs (Martin 2008). Average movement distances (based on recent radiotelemetry studies) were approximately 300m, though periodic longer distance movements (> 1km) have been documented (Liang 2010, Martin 2008). Springs upslope from meadows, rodent burrows, and surface objects such as logs are features that appear

to be important for adult foraging and over-wintering habitat (Kagarise Sherman 1980, Karlstrom 1962, Martin 2008, Liang 2010).

YOTO occurrences on the ENF are located at the northern extent of their range in the Sierra Nevada Mountains (between Highway 88 and Highway 4). These populations are thought to be hybrids of YOTO and Western Toads, since many look similar to Western Toads (Figure 6a) but have the distinctive trill vocalization of the YOTO. More genetic sampling is needed to determine their genetic make-up and confirm hybridization. Despite the uncertainty of the purity of the YOTO found in the area, the USFWS considers these toads the federally Threatened YOTO for all analysis and consultation purposes.

In 2003, and between 2011 and 2014, USFS visual encounter surveys (VES) were performed along travel routes that were closed to public use and needing restoration work (including Routes 19E01 and 09N01). Any wet meadow and other wet aquatic features (i.e. streams, seeps, and springs) within 100 meters (upstream and downstream) of the travel routes were surveyed. YOTO were observed on numerous occasions during VES conducted in the aquatic features and meadows associated with routes 19E01 and 09N01 (Table 5, Figure 6). In addition to the travel route specific surveys, other forest-wide survey efforts have detected YOTO in the project area as displayed in Figure 6.

Table 5: USFWS surveys of aquatic features and detection results for YOTO along routes 19E01 and 09N01.

Route Name	Survey Dates	Survey Results
Deer Valley 4WD Trail (19E01)	7-16-2003	-1 juvenile YOTO
	7-28-2011	-trout
	10-21-2012	-trout
	6-17-2014	-trout
	8-27-2014*	-2 adult YOTO near the 19E01 stream crossing at Blue Creek
Meadow Lake Road (09N01)	7-27-2011	-None
	9-26-2012	-None
	6-10-2014	-6 YOTO juveniles crossing 09N01
	7-12-2014	-1 sub-adult YOTO
	7-21-2014	-Trout and 1 YOTO subadult

In addition to the documented occurrences of YOTO summarized in Table 5 and displayed in Figure 6, other incidental sightings of both live (Figure 7a) or crushed, dead toads (Figure 7b) have occurred. For instance, a dried up, crushed, toad (Figure 7b) was observed by a Forest Biologist on Route 19E01 on 9/10/2010 and another 2 crushed juvenile toads were found by a PG&E biologist on July 25, 2001in the same vicinity. Two living adult YOTO were observed during a field visit by the FS interdisciplinary team near the proposed restoration sites on Route 19E01 on 8/27/2014.

PG&E also conducted surveys during project planning and implementation of the Mokelumne River hydropower project (Jones and Stokes 2002, 2003; ECORP 2010; Herman 2012). Survey results for surveys conducted in the general vicinity of Route 19E01 and Route 09N01 are displayed in Table 6. Many of these detections occurred at locations also displayed in Figure 6.

Table 6. PG&E YOTO survey results from 2001 to 2012 (Jones and Stokes 2002, 2003; ECORP 2010; Herman 2012).

Year	Water year	Survey date	Observations
2001	Dry	June 6-7	Juvenile toads seen at meadow near Clover Valley. Juvenile toads seen about 500 m east of the Twin Lake spillway. 14 juveniles along Road 9N83 to Clover Valley.
		June 26	Juveniles and tadpoles seen at seep near Twin Lake dam.
		Early July	Tadpoles at Upper Blue Lake. Juvenile toads seen about 500 m east of the Twin Lake spillway.
		July 2	8 Juveniles (this years and 2-3 year olds) along Road 19E01 to Clover Valley (2 dead - run over).

		July 25	-19E01 to Clover Valley (2 Dead – Run Over). Juveniles and tadpoles seen west of Twin Lake. No toads east of Twin Lake spillway. None seen along road to Clover Valley
2002	Below normal	June 13	Adults breeding at Upper Blue Lake.
		June 26	Numerous tadpoles and 1 juvenile at Upper Blue Lake. No other locations surveyed.
2009	Low side of below normal	June 17	Adults breeding at Upper Blue Lake, none seen west of Twin Lake
		June 30-July 1	Adults at south shore Twin Lake and Upper Blue Lake. Juveniles west of Twin Lake.
		July 13-14	1 sub-adult at Upper Blue Lake, tadpoles at Twin Lake south shore and north shore.
2010	High side of below normal	July 14	3 adults and numerous tadpoles at Upper Blue Lake
		July 30	1 adult and numerous tadpoles at Upper Blue Lake
		August 3	1 juvenile, lots of tadpoles, no adults seen at Upper Blue Lake
2011	Wet	July 28	None seen at Upper Blue Lake, Twin lake not surveyed
2012	Dry	June 21	None seen at Upper Blue Lake. Twin lake not surveyed.
		July 2	None seen at Upper Blue Lake. Twin lake not surveyed.
		July 16	None seen at Upper Blue Lake. Twin lake not surveyed.
		July 30	None seen at Upper Blue Lake. Twin Lake - abundant tadpoles and metamorphs (4-legged tadpoles through full metamorphs)

Yosemite toads are typically associated with relatively open, wet meadows and are primarily active from late spring through early fall (Karlstrom 1962). They use a wide variety of high montane and subalpine lentic habitats, including wet meadows, lakes, and small ponds, as well as shallow spring channels, side channels and sloughs. Breeding most commonly occurs in shallow, warm water areas in wet meadows, small permanent and ephemeral ponds, slow moving streams, and flooded, shallow, grassy areas adjacent to lakes (Karlstrom 1962, Mullally 1953). These warm, shallow water habitats must persist long enough into the summer for tadpole development and metamorphosis (Jennings and Hayes 1994, Karlstrom 1962, Martin 2008). Additional information defining suitable habitat is described in the Federal Register (UDSI 2013a). The two essential habitats required by the toad include suitable breeding and upland/dispersal habitat.

Proposed CH for the Yosemite toad on the Eldorado National Forest lies within Proposed CH Unit 1- Blue Lakes/Mokelumne, which consists of 34,338 acres of Federal land on three forests. A proportion of suitable habitat in the project area was included in the YOTO Proposed CH published in the Federal Register (USDI 2013a). Proposed CH Unit 1 is considered essential to the conservation of the species because it represents the northernmost portion of the Yosemite toad range and constitutes an area of high genetic diversity (USDI 2013a). In the proposal to designate CH (USDI 2013a) the USFWS described the characteristics essential to the conservation of the YOTO. These characteristics define primary constituent elements (PCEs) of critical habitat. The PCEs specific to YOTO are:

Aquatic breeding habitat.

a) This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, spring systems, and shallow areas of lakes, that:
    i. Are typically (or become) inundated during snowmelt,
    ii. Hold water for a minimum of 5 weeks, and
    iii. Contain sufficient food for tadpole development.
b) During periods of drought or less than average rainfall, these breeding sites may not hold water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years.

1. Upland areas.

a) This habitat consists of areas adjacent to or surrounding breeding habitat up to a distance of 1.25 km (0.78 mi) in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, and areas that provide:
    i. Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia,
    ii. Foraging habitat,
    iii. Adequate prey resources,
    iv. Physical structure for predator avoidance,
    v. Overwintering refugia for juvenile and adult Yosemite toads,
    vi. Dispersal corridors between aquatic breeding habitats,
    vii. Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat, and/or
    viii. The natural hydrologic regime of aquatic habitats (the catchment).
b) These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base.

Status of the Habitat / Existing Condition in the Project Area

For the purposes of analysis, potentially suitable YOTO habitat is defined as wet meadow habitat occurring above 6,500 feet. Also included in the definition of suitable habitat is all land within a 1250 m (4101 ft.) buffer. This habitat buffer is assumed to encompass likely suitable upland and overwintering habitat. Since adult YOTO spend a limited amount of time in aquatic habitats, it is likely potential impacts could occur within this entire buffered area.

A proportion of the suitable habitat in the project area occurs within Proposed CH (CH Unit 1-Blue Lakes/Mokelumne). Because a CH proposal does not signal that habitat outside the proposed area is unimportant or not needed for recovery of the species (as described in Section III. Current Management Direction), the types of potential effects explored during analysis will include suitable habitat both within and outside of Proposed CH (Table 7 and Table 10). The term *suitable habitat* will be used throughout the analysis of effects to collectively describe the potential effects to both suitable and Proposed CH.

The potentially suitable meadow habitat within 1 mile of Routes 19E01 and 09N01 is summarized in Table 7 and displayed in Figure 8. The 1-mile buffer was chosen as a way to quantify habitat availability within the vicinity of the project area. There is no ecological relevance to the chosen 1-mile buffer, although it provides a more focal look at the extent of habitat connectivity in the vicinity of the proposed actions.

Table 7: A summary of YOTO potentially suitable habitat found within 1 mile of the Project Area.

19E01 (Deer Valley 4WD Trail)	
Habitat Type	Acres
a. SUITABLE HABITAT[a]	
Meadows	103.62
Meadows: Upland	5920.57
TOTAL	6023.69
b. PROPOSED CRITICAL HABITAT[b]	
Meadows	79.41
Meadows: Upland	1405.09
TOTAL	1484.50

09N01 (Blue Lakes / Meadow Lake Road)	
Habitat Type	Acres
a. SUITABLE HABITAT[a]	
Meadows	157.60
Meadows: Upland	3046.64
TOTAL	3204.24
b. PROPOSED CRITICAL HABITAT[b]	
Meadows	132.17
Meadows: Upland	2596.27
TOTAL	2728.44

[a] = *Suitable Habitat* includes *all* suitable habitat (including Proposed CH), the acres reported under *suitable habitat* are inclusive of those reported under Proposed CH;
[b] = Proposed CH only includes the suitable habitat occurring within the Proposed CH boundary (Figure 6).

Approximately 262 acres of potentially suitable YOTO meadow habitat and 8968 acres of upland / overwintering habitat occur within 1 mile of the proposed Deer Valley 4WD Meadow Restoration and Blue Lakes / Meadow Lake Road Maintenance Project actions (Table 7, Figure 8). The entire length of Routes 19E01 and 09N01 occur within suitable YOTO habitat (Figure 8). These routes not only run adjacent to, but also directly intersect both wet meadow and upland / overwintering habitat. The majority of the habitat intersected by these two routes, however, is upland / overwintering habitat (Table 7, Figure 8).

19E01 – Deer Valley 4WD Trail

Blue Creek, Deer Creek, and the wet meadows surrounding Route 19E01, provide aquatic habitat for the YOTO. Route 19E01 is not currently diverting or disrupting the natural surface and subsurface water flow paths of the meadows or streams in which it runs adjacent to or intersects (S&G 100). Therefore, the natural hydrologic connectivity of the meadows and streams along this route are intact. Despite this compliance with S&G 100, some sections of Route 19E01 have a degraded trail condition that is accelerating stream bank erosion (see trail re-route Figure 1) and degradation of meadow vegetation due to off-trail motorized vehicle travel (see revegetation points V1-V5 Figure 1).

YOTO have been observed utilizing meadow habitat along the edge of Deer Creek in Deer Valley (Meadow 09N83-2 Figure 1 and Figure 6), but because both Blue Creek and Deer Creek have high early season stream flows, they do not provide suitable YOTO breeding habitat. During periods of low flow both Blue and Deer Creek may, however, provide upland (dispersal, foraging) habitat for juvenile and adult YOTO.

09N01 – Blue Lake / Meadow Lake Road

Twin Lake, Meadow Creek, and the wet meadows surrounding Route 09N01 provide aquatic habitat for the YOTO. As stated in Section IV (Description of the Proposed Action), Route 09N01 is currently disrupting the hydrological connectivity of meadows and streams at various locations. Route 09N01 bisects both wet meadows and streams for much of its length. It is a wet route and dispersing young YOTO have been observed in both wet and dry crossing areas (Figure 6).

The first 1.76 miles of the open portion of Route 09N01 runs adjacent to Twin Lake, a known reproductive site for YOTO (Figure 6). The juvenile and young adult YOTO found below Twin Lake in the wet meadows and in Meadow Creek may have originated from the breeding population at Twin Lake. Route 09N01 was constructed many years ago. It's original construction intercepted snowmelt runoff in the meadows. It's hardened route acted like a stream channel, carrying sediment from the meadow to Meadow Creek and disrupted the continuity of the meadow hydrology. The Meadow Creek crossings have increased in size over time and the streambeds have become shallow and filled with sediment.

YOTO are less susceptible than SNYLF to regulated stream flows and fish presence in the vicinity of the project area. Unlike SNYLF, YOTO have a short life cycle, breed most often in ephemeral waterbodies, spend most of their time in upland habitats, and are unpalatable to fish. The meadows and upland habitats surrounding the project area provide all of the attributes necessary for YOTO to complete their lifecycles and persist including; aquatic breeding habitat that holds water for at least 5 weeks, upland habitat with sufficient cover, foraging habitat, aquatic prey resources, predator refugia, overwintering refugia, and dispersal corridors between breeding habitats.

YOTO may however, be more susceptible to predation by waterfowl in the vicinity of the project area. It appears that waterfowl (geese and ducks) are attracted to regulated lakes such as Upper and Lower Blue Lake, Twin Lake, and Meadow Lake. We suspect that the increased presence of

waterfowl in the area leads to a higher risk of predation on adults, juvenile, and larvae YOTO in this area, however this is purely speculation.

VI. EFFECTS OF THE PROPOSED PROJECT

Direct and Indirect Effects

In order to determine a relative measure of the direct and indirect effects to LCT, SNYLF, and YOTO, indicators were chosen to quantify the amount of suitable habitat potentially affected by project activities. The risk of direct and indirect impacts to individuals and their habitats are greatest when operations occur in close proximity to occupied or suitable habitat. For this reason, the amount and type of actions proposed within suitable habitat buffers, the habitat type affected, and whether or not occupancy has been detected, were used as indicators of risk and in formulating the effects determinations for each species.

In general the risk to LCT, SNYLF, and YOTO increases as the amount of activity within occupied or suitable habitat increases. Similarly, where no project activities are proposed to occur within LCT, SNYLF, and YOTO habitat or within their suitable habitat buffers, there is little to no risk that project activities would result in any direct or indirect effects.

The amount of LCT, SNYLF, and YOTO suitable habitat that may be directly impacted by the proposed project activities are summarized in Tables 6-8. The acres of upland habitats include all lands within 25 m (82 ft.) of suitable lake, stream, and meadow habitat for the SNYLF, and all lands within 1250 (4101 ft.) of wet meadows for the YOTO.

Lahontan Cutthroat Trout

Proposed project activities may affect LCT and their habitat (Table 8). In order for the project to result in a measurable effect to LCT or their habitat, LCT presence and habitat suitability need to be considered. A lack of LCT and or low habitat suitability can minimize the quantification of effects to a species from major or moderate to minor or negligible. As mentioned previously in Section V. Existing Environment, Lahontan Cutthroat Trout, Surveys and Sightings, no LCT have been documented to occur in Blue, Deer, or Meadow Creeks in the project area. Twin Lake provides the only unobstructed source for LCT into Blue and Deer Creeks and Meadow Lake provides the only source for LCT into Meadow Creek. The remaining known "populations" of LCT (albeit stocked) are physically isolated from Blue, Deer, and Meadow Creeks by regulated dams.

Table 8: A summary of the quantity of overlap between proposed project activities and suitable LCT habitat.

	LCT	
	Lakes	Stream (# Crossings or # Points)
19E01		
Re-open 19E01	None	1 - Blue Creek 1 - Deer Creek
Re-route 19E01	None	1 - Deer Creek
Harden Stream Crossing	None	1 - Deer Creek
Stream Bank Restoration (V1-V5 Figure 1)	None	4 - Deer Creek 1 - Blue Creek
09N01		
Re-open 09N01	None	1 - Meadow Creek[a]
Road Maintenance	None	1- Meadow Creek[a]

[a] = the crossing at Meadow Creek is not a *wet* crossings. A culverts is present allowing for travel over the habitat and not directly through it.

These regulated habitats affect not only stream flow but also spawning migration, distribution, the ability to genetically diversify, and water temperature. Regulated flows interfere with the natural

timing of seasonal flows and could a) interrupt the triggering of a LCT's intrinsic response to initiate a spawning migration or b) cause the response to occur earlier or later than would be naturally optimal. Another impact of regulated waterbodies is the presence of dams. Physical barriers dramatically affect the ability for a species to disperse and ultimately to genetically diversify. Physical barriers also reduce a species access to suitable habitat and increase predation and competition pressures.

Rainbow, brown, and brook trout are all known competitors and potential predators to LCT and have replaced LCT in most of its native range. Moyle (2002) explains that "with few exceptions, populations (*of LCT*) decline and disappear following the introduction of rainbow, brown, and brook trout. As such, habitats which contain rainbow, brown, or brook trout could be considered less or un- suitable for LCT. As shown in Tables 2b and 2c, both Rainbow and Brook trout occur in Blue Creek, Deer Creek, and Meadow Creek and anecdotal evidence suggests that they are numerous. Therefore, presence of rainbow and brook trout reduces the habitat suitability and subsequently the likelihood of LCT presence in these creeks.

Due to the low habitat suitability, as explained above, and the lack *or* low likelihood of occupancy, project related effects are not expected to occur at a level greater than those effects occurring as a result of the physical barriers (dams), flow regulation, or presence of non-native trout. Despite the unlikelihood that the project will measurably affect LCT, the potential effects that the proposed project may impose upon LCT should they occur in the area, and their habitat (although poorly suitable) were analyzed. Effects are described per action below.

Following the discussion of potential effects, a determination of effects is made in Section VIII. This determination was based on the risk of the potential effects, lack of LCT presence, the probability of LCT presence in the future, low habitat suitability, and the presence of non-native trout.

Re-Opening Routes 19E01 and 09N01:

Potential Direct Effect - OHV use of Routes 19E01 and 09N01 is expected to occur at a rate similar to that occurring prior to the closure (i.e. 19E01 - 30 OHV / weekend day, 2-5 OHV / weekday – consisting of 40% 4WD jeep, 40% motorcycle and 20% ATV and 09N01 - 30-40 OHV / weekend day, 20-30 OHV on a weekday (M-F)). Use of Route 19E01 would allow travel directly through Blue Creek and Deer Creek where Route 19E01 crosses each creek (Table 8, one location on each creek). Although users may travel directly through potential LCT habitat in Blue and Deer Creeks, direct injury or mortality is not expected as a result of re-opening either Route 19E01 or 09N01. LCT, like other stream dwelling fish, typically flee an area (upstream or downstream) as a disturbance approaches (i.e. human presence, OHV) thereby avoiding direct contact with vehicles crossing the streams. The innate response to flee the area however, is itself, a behavioral disturbance causing movement and an energy expenditure that would not otherwise occur. As an isolated or occasional occurrence, this disturbance-induced movement would cause a minor, temporary effect on the behavior of LCT. Repeated instances of disturbance however, could manifest in a misuse and net loss of energy. Unnecessary use of energy and relocation to areas potentially less favorable for the LCT could reduce an individual's ability to seek refuge and avoid predation, increase their susceptibility to disease, or impact future recruitment.

Contrary to Route 19E01, there are no wet crossings along Route 09N01. Culverts allow Route 09N01 to travel over Meadow Creek, therefore not only is the risk of injury or morality non-existent, but the likelihood of a behavioral disturbance is low. Travel occurring within the prism of the existing trail is unlikely to disturb any LCT or other fish inhabiting the waters below the route.

Potential Indirect Effect - The re-opening of Routes 19E01 and 09N01 may cause an increased risk of sedimentation or other water quality issues (i.e. turbidity) downstream of the stream crossings at Blue Creek and Deer Creek or in Meadow Creek. Sedimentation would have the greatest impact on the availability and/or suitability of spawning habitat. LCT spawning habitat could be reduced by an increase in sediment. Gravel or cobble riffles more than 40% covered with fine sediment would provide below average to low stream condition for LCT spawning (NRCS 2007). Sedimentation accumulating to a measurable level in the fall and winter months would have a lessor effect on LCT than an increased presence during the spring and early summer (April through July, spawning period). Blue and Meadow Creeks are more susceptible to increased sedimentation than Deer Creek because their flow does not naturally fluctuate due to dam regulation originating at Lower Blue Lake and Twin Lake, respectively.

Risk of Effects – Low / Minor

Behavioral disturbance would be isolated in location, occurring only at each 19E01 crossing of Blue and Deer Creek (1 location on each stream) or in areas where Route 09N01 travels in close proximity to Meadow Creek . Therefore, even if LCT were disturbed repeatedly, the affect would be small and localized.

The typical spawning season for LCT is April through July (depending on stream flow, elevation, and water temperature) a time period that coincides with the proposed seasonal closure. In an unregulated stream, annual sedimentation would likely be flushed downstream before sediment depths increased to a level capable of affecting LCT. Since Blue, Deer, and Meadow Creeks are each affected by regulated flow operated by PG & E's hydropower project, this annual sediment flushing is not readily predictable or reliable. However, because the regulated streams of Blue Creek (which flows into Deer Creek) and Meadow Creek likely have higher stream flows during the summer and fall seasons (the anticipated period of heaviest use along the Routes) than would occur under the natural hydrograph, sedimentation occurring during this time would be more likely to be carried downstream.

In contrast to higher summer and fall flows, spring flows would be controlled at a lower rate than would naturally occur while water is being stored in the reservoirs. Native species such as the LCT, are adapted to natural hydrograph fluctuations. Spawning occurs as an intrinsic response to natural cues related to temperate and stream flow. An alteration of these cues reduces the likelihood that spawning will occur and thus reduces the habitat suitability within the regulated reaches. For these reasons, 1) the low likelihood of LCT occupancy (presence) in either Blue Creek, Deer Creek, or Meadow Creek, 2) the small, localized risk of disturbance, 3) stream flow regulation and 4) the subsequent reduction in habitat suitability the risk of re-opening Routes 19E01 and 09N01 in regards to disturbance and sediment related effects is low.

Re-Route 19E01:

Potential Direct Effects - The majority of the re-routing of Route 19E01 will occur outside of potential LCT habitat. The re-route effort is intended to move the trail away from areas of active stream bank erosion and to improve the angle of approach at the existing crossing at Deer Creek. Since none of the proposed work to re-route Route 19E01 would occur directly within the stream channel, there would be no direct effects to LCT from implementing this action.

Potential Indirect Effects - The actions necessary to re-route Route 19E01 and improve the angle of the approach to Deer Creek may cause a temporary increase in sedimentation in Deer Creek as a result of the ground disturbing activities.

Risk of Effects – Low / Minor

The amount of sediment released during the re-routing would likely be insignificant and unmeasurable within a few days of project completion. The re-route and realignment is expected to reduce future sedimentation and improve stream water quality after completion. An improvement in stream water quality is expected to be measurable within 1 year (season) post-implementation.

Harden Stream Crossing (19E01 @ Deer Creek):

Potential Direct Effects –LCT potentially present at or near this crossing could be disturbed during placement of the rock material. Disturbance would manifest as a short-term modification in behavior (i.e. fleeing to refuge, or localized abandonment). No injury or mortality of individuals is expected to occur as a result of this action because LCT are expected to flee the area upon the arrival of crews.

Potential Indirect Affects – Some sedimentation from turbid water may occur in the localized area during the movement and placement of the large rock materials.

Risk of Effects – Low / Minor

The actions associated with hardening the stream crossing would be completed in less than 2 days and therefore, disturbance to LCT as a result of this action would be temporary and minor. Ground disturbance near the stream would be limited to rock placement because the majority of the rock used to harden the stream crossing will be imported from the Clover Valley sediment field. Water quality in Deer Creek is expected to improve after the approach hardenings are completed.

Stream Bank Restoration:

Potential Effects - Since none of the proposed work to restore these stream banks would occur directly within the stream channel, no LCT injury or mortality is expected to occur as a result of this action. Similar to the other actions proposed, the presence of crews along the stream bank during implementation could, however, cause a temporary behavioral disturbance to present LCT (i.e. fleeing to refuge or local abandonment).

Risk of Effects – Low / Minor

Since the scope of implementing the stream bank restoration is minor, disturbance would be temporary and would not cause a lasting effect on LCT behavior or persistence in the area. Furthermore, these restorative actions should result in bank stabilization and subsequently reduce the potential that future erosion and sedimentation would occur; indirectly improving the future water quality and stream condition in Deer Creek and Blue Creek.

Road Maintenance 09N01:

Potential Effects - Actions occurring within a few feet of the edge of the road prism (i.e. re-grading, rolling dip repairs, and graveling) would not directly affect the stream courses, LCT, or their potential habitat. Actions associated with culvert repair or installation may however, affect LCT.

Culvert maintenance occurring at crossings of Meadow Creek may disturb LCT present at the time of implementation and cause increased stream turbidity or sedimentation downstream. Any culvert work occurring at the other ephemeral or intermittent stream crossings along Route 09N01 may also add to stream turbidity and sedimentation within Meadow Creek because each of these streams flow into Meadow Creek.

Risk of Effects – Low / Minor

Improving culvert function by installing catch basins, new culverts, and clearing out or upgrading undersized culverts in addition to re-grading the road surface, repairing rolling-dips, and adding gravel along steep sections of the roadway, are all actions expected to improve the existing condition of the meadows and streams along Route 09N01. These actions would greatly improve or remediate the currently occurring road runoff, which is resulting in sedimentation in the streams adjacent to the route.

Despite these potential effects, the functionality of the culverts and subsequently stream condition would be improved after completion of the work. Therefore implementation of the proposed culvert maintenance is expected to improve LCT habitat.

Sierra Nevada Yellow-Legged Frog

Proposed project activities may affect SNYLF and their habitat (Table 9). As described for the LCT, in order for the project to result in a measurable effect to SNYLF or their habitat, SNYLF presence and habitat suitability need to be considered. A lack of SNYLF presence and/ or low habitat suitability can minimize the risk of effect to a species. No SNYLF have been documented to occur within 0.8 miles of the project area (Table 3).

Blue Creek, Deer Creek, and Meadow Creek are all regulated streams. Their flows are affected by releases from the Lower Blue Lake or Twin Lake reservoirs. Due to this regulation, these streams likely experience lower spring runoff and higher summer and fall stream flows than they would under a naturally occurring hydrograph. Native species such as the SNYLF are adapted to natural hydrograph fluctuations that trigger breeding and non-breeding activity. Although, SNLYF more commonly breed in and inhabit high alpine lake habitats, they are occasionally found in streams (especially in the northern reaches of their range). If, SNYLF resided in the area historically, the construction of dams and subsequent changes in hydrograph probably made their aquatic habitat inhospitable and explains their current lack of presence.

Blue Creek, Deer Creek, and Meadow Creek have resident non-native trout populations. According to Moyle (2002), trout were not historically found above 6,000 feet in elevation prior to their stocking in lakes and streams. The Federal Register (2013a) identifies introduced non-native trout and disease as the primary causes of population declines of the frogs of SNYLF. Introduction of non-native fishes (i.e. trout) has significantly reduced the distribution and abundance of these frogs (Knapp et al. 2001). It is estimated that 63 percent of lakes larger than 1 hectare (2.5 acres) and greater than 60 percent of streams in the Sierra Nevada contain one or more nonnative trout species (Knapp 1996, Federal Register 2013a). The multiple year tadpole stage and the highly aquatic nature of subadults/adults increases the frog's susceptibility to predation by trout throughout its lifespan. Therefore, the presence of non-native trout (rainbow and brook) reduces the habitat suitability and subsequently the likelihood of SNYLF presence in these creeks.

Due to the low habitat suitability and the lack *or* low likelihood of occupancy, project related effects are not expected to occur at a level greater than those effects occurring as a result of the flow regulation or presence of non-native trout. Despite the unlikelihood that the project will measurably affect SNYLF, the potential effects that the proposed project may impose upon SNYLF should they occur in the area, and their habitat (although poorly suitable) were analyzed. Effects are described per action below.

Re-Opening Routes 19E01 and 09N01:

Potential Direct Effect -Re-opening the approximately 3.17 mile portion of Route 19E01 and the 1 mile portion of Route 09N01that are currently closed would allow motorized use of the routes similar to that occurring prior to the closure. Use of Route 19E01 would allow travel directly through potentially suitable SNYLF stream and upland habitat (Table 9 and Figure 4). Route

19E01 has wet crossings at Blue and Deer Creeks, four unnamed intermittent streams, travels through upland habitat for approximately 0.46 miles and meadow habitat for 0.43 miles (Table 9 and Figure 4). Since SNYLF are typically closely associated with water (within a couple of meters), the risk of disturbance, injury, or mortality is greatest within the wet crossings. SNYLF present in the wet crossings or along the bank would likely attempt to avoid injury or mortality by retreating into the aquatic habitat. Most often this behavior would be successful in preventing an injury or death. A frog may, however, retreat to the aquatic habitat and seek refuge under cover located directly in the path of the motorized vehicles crossing the habitat. If this circumstance occurred, the SNYLF would be vulnerable to crushing. The behavior involved in the escape / retreat response despite the ultimate outcome would constitute a physical disturbance to the frog. Such behaviors could make the frog more susceptible to predation as it is flushed from its cover or basking habitat.

Contrary to Route 19E01, there are no wet crossings along Route 09N01 and only a fraction of upland habitat (Table 9). Route 09N01 contains numerous culverts allowing travel above the stream course and not through it. Due to the SNYLF propensity to water and the lack of wet crossings, injury or mortality of individual SNYLF is not expected to occur as a result of motorized wheeled vehicle use along Route 09N01.

Despite the SNYLF propensity to water, frogs may use upland habitats including refuge under downed woody debris. SNLYF potentially occupying the upland habitat are vulnerable to crushing if a motorized wheeled vehicles hits or runs over a cover object being used by the frog. If, however, the motorized vehicles remain within the road prism and do not travel cross-county, the risk of injury and mortality is greatly reduced because SNYLF are not likely to be found on the road surface.

Table 9: A summary of the quantity of overlap between proposed project activities and suitable SNYLF habitat.

		SNYLF			
		Lakes	Stream (# Crossings or # Points)	Upland[a] (miles)	Meadow[b] (miles)
Suitable Habitat	*19E01*				
	Re-open 19E01	None	1 - Blue Creek 1 - Deer Creek 4 Unnamed Intermittent	Perennial – 0.17 Intermittent – 0.29	0.43
	Re-route 19E01	None	1 - Deer Creek	Perennial – 0.02	0.01
	Harden Stream Crossing (Figure 1, V1)	None	1 - Deer Creek	NA	NA
	Stream Bank Restoration (Figure 1, V2-V5)	None	4 - Deer Creek 1 - Blue Creek	NA	NA
	09N01				
	Re-open 09N01	None	1 - Meadow Creek[d] 1 Unnamed Intermittent[d]	Perennial – 0.17 Intermittent – 0.06	0.24
	Road Maintenance	None	1 - Meadow Creek[d] 1 Unnamed Intermittent[d]	Perennial – 0.17 Intermittent – 0.06	0.24
Proposed Critical Habitat[c]	*19E01*				
	Re-open 19E01	None	1 - Blue Creek	Perennial – 0.03	0.19
	Re-route 19E01	None	0	0	0
	Harden Stream Crossing (Section X. Figure 1, V1)	None	0	NA	NA
	Stream Bank Restoration (Figure 1, V5)	None	1 - Blue Creek	NA	NA
	09N01				
	Re-open 09N01	None	1 - Meadow Creek[d] 1 Unnamed Intermittent[d]	Perennial – 0.17 Intermittent – 0.06	0.24
	Road Maintenance	None	1 - Meadow Creek[d] 1 Unnamed Intermittent[d]	Perennial – 0.17 Intermittent – 0.06	0.24

[a] = miles within 25 m (82 ft.) of suitable stream or lake habitats; [b] = miles within meadow habitat and the area within 25 m (82 ft.) of the meadow boundary; [c] = The miles, or # crossings / points reported for Proposed CH are included in the total reported for suitable habitat as well; [d] = the crossings at Meadow Creek and the unnamed intermittent stream are not *wet* crossings. Culverts are present allowing for travel over the habitat and not directly through it. The differences in these types of crossings are captured in the effects analysis.

Potential Indirect Effect - Re-opening Routes 19E01 and 09N01 may also cause an increased risk of sedimentation and chemical contamination to aquatic habitats. Re-opening this route to public motorized vehicle access is expected to return user frequency to the rates experienced prior to the forest closure. Therefore, the risk of sedimentation and chemical contamination after the re-opening of the route would be similar to that which occurred prior to the forest closure if no maintenance or restorative actions were to be implemented along the Routes. An increase in sediment delivery to suitable aquatic habitat may cause a reduction in deep water habitat, fill the spaces between and under refuge features, and bury/cover foraging substrates. A reduction in depth of deep water habitats may affect individual SNYLF by making them more susceptible to annual freezing and potentially reduce the overwintering success of tadpoles and post-metamorphic adults. If the reduction in depth persists over multiple years, population abundance could be affected because reproductive success would be reduce or eliminated. A reduction in the quantity of interstitial spaces and underwater cover may lead to an increase in predation risk. As sedimentation begins to cover tadpole foraging substrates, the opportunities for feeding are also reduced, leading to a retardation of tadpole growth and development. Any delay in time to metamorphosis increases the tadpoles risk of predation and susceptibility to the chytrid fungus and a reduction in food may result in a smaller size at metamorphosis. These effects could impact recruitment rates and ultimately population size and abundance over longer periods of time.

Skin permeability of amphibians makes SNYLF more susceptible to vehicle emissions, oil and gas leaks or spills. Adverse effects of these pollutants to amphibians may include reduced survival, growth, and metamorphosis, altered physiology and behaviors, deformities in tadpole oral cavities, and elevated levels of stress hormones. Vehicle related pollutants could enter into the aquatic habitats at the two stream crossings (Blue Creek and Deer Creek) along Route 19E01 although, SNYLF have not been found occupying Blue or Deer Creek.

The proposed seasonal closure of Routes 19E01 and 09N01 would limit SNYLF exposure to the risk of disturbance, injury, or mortality in both aquatic and upland habitats. SNYLF would only be susceptible to these potential effects during periods outside of the proposed seasonal closure Enforcement of the seasonal closure would eliminate the risk of disturbance, injury, or mortality of SNYLF within the closure area and period along the Routes.. In addition, implementing a seasonal closure would allow time for the routes to dry prior to vehicle use, further reducing the likelihood that SNYLF would be found on the routes (as SNYLF have a close affinity to water).

Behavioral disturbance would be isolated in location, occurring only at each 19E01 crossing of Blue and Deer Creek (1 location on each stream) or in areas where Route 09N01 travels in close proximity to Meadow Creek. Therefore, even should a SNYLF become disturbed repeatedly, the effect would be small and localized.

The actions proposed to harden the crossing at Deer Creek, the proposed Blue Creek and Deer Creek streambank restoration actions, and road maintenance of Route 09N01 were designed to reduce the impacts the routes were causing to the surrounding habitats (including sedimentation). Upon completion of these proposed actions, the risk of sedimentation occurring as a result of re-opening the Routes would be reduced or fully mitigated until future degradation occurs.

Prior to the restorative actions being completed along Route 19E01, an elevated risk of sedimentation exists. However, because the regulated streams of Blue Creek (which flows into Deer Creek) and Meadow Creek likely have higher stream flows during the summer and fall

seasons (the anticipated period of heaviest use along the Routes) than would occur under the natural hydrograph, sediment entering the aquatic habitats during this time would be more likely to be carried downstream.

Risk of Effects – Low / Minor

The risk of re-opening Routes 19E01 and 09N01 in regards to disturbance, injury, mortality and sediment or chemical contamination is low because: 1) the lack of and low likelihood of SNYLF occupancy (presence) in either Blue Creek, Deer Creek, or Meadow Creek, 2) the small, localized risk of disturbance, 3) stream flow regulation and 4) the presence of non-native predatory trout and the subsequent reduction in habitat suitability.

Re-Route 19E01:

Potential Direct Effects - The majority of the re-routing of Route 19E01 would occur outside suitable SNYLF habitat (Table 9). The re-route effort is intended to move the trail away from areas of active stream bank erosion and to improve the angle of approach at the existing crossing at Deer Creek. Since none of the proposed work to re-route 19E01 would occur directly within the stream channel, there is little likelihood of a risk of direct effects to SNYLF from implementing this action. Nonetheless, if SNYLF are present along the banks at the crossing at Deer Creek, or along the 0.02 miles of route located within upland habitat and the 0.01 miles of route located within meadow habitat during implementation they could be disturbed, injured, or killed. Disturbance of SNYLF could manifest in escape / retreat behavior. As crews enter the area, it is expected SNLYF would retreat into the nearest aquatic habitat and seek refuge. Once in the aquatic habitat, the re-route actions would not cause any injury or mortality of individual SNYLF.

Frogs utilizing the 0.02 miles of route located within upland habitat and the 0.01 mile of route located within meadow habitat, could be vulnerable to crushing if trail building equipment hits or runs over a cover object being used by the frog.

Potential Indirect Effects In addition to the risk of disturbance, injury, or mortality the construction of the new re-routed trail and improving the angle of the approach to Deer Creek may cause a temporary increase in sedimentation to Deer Creek as a result of ground disturbing activities. These risks, however, would not only be short-term, occurring only during the actual implementation period, they would also be highly localized because the overlap between the actions associated with the re-routing of the trail and suitable habitat is exceptionally low (Table 9). Furthermore, once completed, the re-route is expected to reduce future sediment delivery and improve the stream water quality of Deer Creek thereby indirectly benefitting SNYLF. A measurable improvement in stream water quality would be expected within 1 year (season) post-implementation.

Risk of Effects – Low / Minor

To mitigate the risk of disturbing or crushing any SNYLF during the re-route construction, qualified personnel will survey the area just prior to starting and during the work (See Section IV. Project Design Criteria). If SNYLF are found within the area where the re-route will be constructed, their safety shall be assessed by qualified personnel and dealt with according to the Terms and Conditions described in the Programmatic BO (USDI 2014);

The amount of sediment released during the re-routing would likely be insignificant and unmeasurable within a few days of project completion. The re-route and realignment is expected to reduce future sedimentation and improve stream water quality after completion. Thereby indirectly benefitting SNYLF. An improvement in stream water quality is expected to be measurable within 1 year (season) post-implementation.

Harden Stream Crossing (19E01 @ Deer Creek):

Potential Direct Effects - The action of hardening the stream crossing at Deer Creek may affect SNLYF and their aquatic habitat. SNYLF potentially present at or near this crossing could be disturbed during implementation and the placement of the rock material. Disturbance would manifest as a short-term modification in behavior (i.e. escape / retreat).

Potential Indirect Effects -Some sedimentation from turbid water may occur in the localized area during the movement and placement of the large rock materials.

Risk of Effects – Low / Minor

The actions associated with hardening the stream crossing would be completed in less than 2 days and therefore, disturbance to SNYLF as a result of this action would be temporary and minor. Ground disturbance near the stream would be limited to rock placement because the majority of the rock used to harden the stream crossing will be imported from the Clover Valley sediment field. Furthermore, since SNYLF are expected to flee the area upon the arrival of crews, no injury or mortality of individuals would be expected to occur as a result of this action. The overall water quality in Deer Creek is expected to be improved after the approach hardenings are completed.

Stream Bank Restoration:

Potential Effects - SNYLF present along the stream banks both in and out of the stream channels may be disturbed by the stream bank restoration activities, although injury and mortality are not expected. SNYLF utilizing the bank areas for refuge or basking at the time of implementation would likely be flushed from the area and seek refuge in the stream channel.

Risk of Effects – Low / Minor

Since the scope of implementing the stream bank restoration is minor, disturbance would be temporary and would not cause a lasting effect on SNYLF behavior or persistence in the area. Furthermore, these restorative actions should result in bank stabilization and subsequently reduce the potential that future erosion and sedimentation would occur; indirectly improving the future water quality and stream conditions of Deer Creek and Blue Creek.

Road Maintenance:

Potential Effects -

Improving culvert function by installing catch basins, new culverts, and clearing out or upgrading undersized culverts in addition to re-grading the road surface, repairing rolling-dips, and adding gravel along steep sections of the roadway, are all actions expected to improve the existing condition of the meadows and streams along route 09N01. These actions would greatly improve or remediate the currently occurring road runoff, which is resulting in sedimentation in the streams adjacent to the route. Actions occurring within a few feet of the edge of the road prism (i.e. re-grading, rolling dip repairs, and graveling) would not directly affect the stream courses, SNYLF, or their potential habitat. Actions associated with culvert repair or installation may however, affect SNYLF.

Culvert maintenance occurring at crossings of Meadow Creek and the unnamed intermittent stream may disturb SNYLF present at the time of implementation and cause increased stream turbidity or sedimentation downstream. Any culvert work occurring at the other ephemeral or intermittent stream crossings along Route 09N01 may also add to stream turbidity and sedimentation within Meadow Creek because each of these streams flow into Meadow Creek. Despite these potential effects, the functionality of the culverts and subsequently stream condition would be improved after completion of the work. Therefore, implementation of the proposed culvert maintenance is expected to improve SNYLF habitat.

Improvements to road surfaces loosen the compaction of the road and make more fine sediment available for erosion via dust and rain runoff (Coe 2006). Maintenance actions are primarily intended to facilitate vehicle use, but limiting hydrologic connectivity to streams is another important aspect of these actions. Re-grading, repairing rolling dips, and adding gravel along the roadway can have long term beneficial effects for aquatic systems by reducing the amount of sediment delivered from the road. Therefore, while road maintenance actions may increase the potential for sediment delivery to SNYLF aquatic habitat during and immediately after implementation, sediment delivery is expected to decrease significantly in the months to years after the completion of the maintenance actions and maintain the reduced rate of sedimentation for 2 – 5 years.

Yosemite Toad

Proposed project activities may affect YOTO and their habitat (Table 10). YOTO have been observed along and in the vicinity of Routes 19E01 and 09N01 (Tables 5 and 6 and Figure 6).

During breeding, YOTO adults are most likely found in or traveling to and from aquatic breeding habitats. Outside the breeding period YOTO adults can be found dispersing and moving through upland habitats. YOTO adults studied at 7,500 ft. do most of their long distance movements within 45 days of the start of breeding (Liang 2014, pers comm.). During this time, the risk of disturbance, injury, or mortality is greatest for adult YOTO. Juvenile YOTO, not yet sexually mature, are also more susceptible to disturbance, injury, or mortality during this time. However, they are more likely to remain in the vicinity of breeding habitat longer (and maybe overwinter there) and travel shorter distances than fully mature adults.

The potential effects the proposed project activities may cause to YOTO and their habitat are described below by action.

Re-Opening Routes 19E01 and 09N01:

Re-opening the approximately 3.17 mile portion of Route 19E01 and the 1 mile portion of Route 09N01that are currently closed would allow motorized use of the routes similar to that occurring prior to the closure. Use of both routes would allow travel directly through suitable YOTO wet meadow and upland habitat (Table 10 and Figures 1 and 8). Motorized travel through these habitats has the potential to disturb, injure, or kill individual YOTO.

YOTO are not as readily startled as SNYLF. Adults, especially those actively breeding, do not exhibit much of an escape / retreat type of behavior. Calling males and in-waiting females are often found in dense refuge before engaging in amplexus. When disturbed or approached they commonly just hunker down in place. This type of behavioral response makes them quite susceptible to injury or mortality, especially if this type of response occurred within the prism of Routes 19E01 and 09N01. Even a toad that actively tries to escape the path of a motorized vehicle is susceptible to injury or mortality due to their inability to move great distances quickly. In contrast to SNYLF, YOTO have short stumpy legs and are ‘walkers’ not ‘jumpers’ or ‘swimmers’. The distance they can travel in one movement is significantly less than that of a SNYLF. Furthermore, YOTO are quite cryptic and small in size, which makes seeing and avoiding them from a moving vehicle quite impossible.

Breeding behavior may also be modified by the mere presence of motorized vehicles. Calling YOTO males have been observed to halt their trilling as vehicles passed by an active breeding site in a high elevation meadow (USFWS 2014, Prog. BA). They have also been observed to temporarily halt trilling when approached by personnel, however they return to calling quickly after the disturbance (K. Wilkinson pers. observation).

Skin permeability of amphibians make YOTO more susceptible to vehicle emissions, oil and gas leaks or spills. Adverse effects of these pollutants to amphibians may include reduced survival, growth, and metamorphosis, altered physiology and behaviors, deformities in tadpole oral cavities, and elevated levels of stress hormones. Vehicle related pollutants could enter into the aquatic habitats at the two stream crossings (Blue Creek and Deer Creek) along Route 19E01. YOTO have not been found occupying Blue or Deer Creek. YOTO have been observed utilizing meadow habitat along the edge of Deer Creek in Deer Valley (Meadow 09N83-2 Figure 1 and Figure 6), but not within the creek itself. Both Blue Creek and Deer Creek have high early season stream flows thus they do not provide suitable YOTO breeding habitat. Therefore, vehicle pollutants are unlikely to come into contact with tadpole or juvenile YOTO. Furthermore, YOTO are not highly aquatic. Their morphology is not adapted for swimming, especially in flowing water. Outside of the breeding period or tadpole life stage, YOTO are rarely found in aquatic habitat. Thus, the risk that vehicle pollutants would affect YOTO is low.

The proposed seasonal closure of Routes 19E01 and 19N01would limit YOTO exposure to the risk of disturbance, injury, or mortality in both wet meadow and upland habitats. Successful enforcement of the seasonal closure would essentially eliminate the risk of disturbance, injury, or mortality of YOTO during the closure period within the closure area along both routes. However, since no physical barriers (i.e. gates) would be installed at either end of Route 19E01 because no suitable locations were identified[3], illicit use of the route may continue to occur. As such, dispersing / emigrating toads are at risk of being injured or killed. Efforts in the future to educate public users, coupled with strict enforcement of the closure periods would help to mitigate this risk. Informational / educational signs and maps would be posted at the trailheads of both routes to help aid in compliance. If full compliance is achieved, YOTO susceptibility to disturbance, injury, or mortality would be limited to periods outside of the proposed seasonal closure.

The intent of implementing a seasonal closure was to limit impacts to YOTO from public motorized vehicle use and minimize the overlap between motorized vehicle use and YOTO habitat utilization in the vicinity of the trail. The risk of disturbance, injury, or mortality of adult YOTO would be the greatest during breeding activity (within 2 weeks of snowmelt). However, since many factors can alter the length of breeding duration and the toads emigration to and from breeding sites (i.e. significant drops in temperature post snowmelt, and additional late season storms) adults may be present in the vicinity of breeding habitat for longer than 2 weeks. In contrast to many other anuran species, YOTO are not typically active or calling during a precipitation event. A drop in temperature or precipitation will often cause males to stop calling and the movement of both males and females becomes rare. As such, although the timing of the emigration of YOTO to and from the breeding sites will vary in direct correlation with snowmelt, the length of time they are found in the area is more variable.

The proposed seasonal closure would exclude motorized use of routes 19E01 and 09N01 within 6 weeks of documented snowmelt as reported from the Blue Lake Snow Sensor Station. Six weeks would provide the greatest chance of significantly reducing the risk of disturbance, injury, or mortality of adult YOTO while allowing public motorized vehicle use to occur annually (C. Liang personal communication). Correlating the seasonal closure with the snowmelt reading at Blue Lake will allow a longer season of use in dry years (the current trend) and a shorter season of use in wetter years. Based on the ecology of the toad, we assume the majority of YOTO movement should occur during the proposed seasonal closure period and expect the closure would allow their movements to occur uninterrupted for the duration of the closure.

[3] = gates (physical barriers) would be ineffective because of the open terrain, remoteness of the trail, and because the types of vehicles typically driven along the trail would be able to circumvent a physical closure

Table 10: A summary of the quantity of overlap between proposed project activities and suitable YOTO habitat.

		YOTO	
		Wet Meadow (miles or # points)	Upland[a] (miles or # points)
General Habitat	*19E01*		
	Re-open 19E01	0.25 miles	3.47 miles
	Re-route 19E01	0 miles	0.08 miles
	Harden Stream Crossing (Figure 1, V1)	# - 1	# - 0
	Stream Bank Restoration (Figure 1, V2-V5)	# - 5	# - 0
	09N01		
	Re-open 09N01	0.07 miles	0.93 miles
	Road Maintenance	0.07 miles	0.93 miles
Proposed Critical Habitat[b]	*19E01*		
	Re-open 19E01	0.21 miles	0.25
	Re-route 19E01	0 miles	0 miles
	Harden Stream Crossing (Figure 1, V1)	# - 0	# - 0
	Stream Bank Restoration (Figure 1, V5)	# - 0	# - 0
	09N01		
	Re-open 09N01	0.07 miles	0.93 miles
	Road Maintenance	0.07 miles	0.93 miles

[a] = miles or number within 1250 m (4101 ft.) of suitable wet meadow habitat; [b] = The miles, or # crossings / points reported for Proposed CH are included in the total reported for suitable habitat as well;

Without the proposed restorative actions (described below), re-opening Route 19E01 may also alter meadow or stream hydrology potentially resulting in their degradation or drying and result in a reduction or elimination of occupied or suitable habitat. YOTO breed in very shallow water habitats within meadows or lakes and a certain amount of mortality of eggs and tadpoles occur naturally from desiccation and freezing. Given this natural vulnerability, any changes that result in decreased amounts and shorter persistence of the preferred shallow water habitats may reduce reproductive success and recruitment, and subsequently the persistence of the species. Assessments of the condition of the stream and meadow habitats occurring along Route 19E01 conducted by ID Team members identified some resource issues in need of repair. Actions proposed to harden the crossing at Deer Creek, in addition to the proposed Blue Creek and Deer Creek streambank restoration actions, are designed to reduce the impacts Route 19E01 was causing to the surrounding habitats. Upon completion, the risk of sedimentation or other hydrologic alterations occurring as a result of re-opening Route 19E01 would be reduced.

Re-Route 19E01: The entire re-routing of Route 19E01 would occur within suitable YOTO upland habitat (Table 10, Figure 1, and Figure 8) but outside of wet meadow habitat. The re-route effort is intended to move the trail away from areas of active stream bank erosion and to improve the angle of approach at the existing crossing at Deer Creek. Constructing the new trail would require the removal of approximately 20 trees (5 of which are greater than 20" dbh) and stumps to clear a new trail corridor. YOTO could be within burrows underground, hiding in grasses, shrubs, stumps, or other downed woody debris along the new route (approximately 0.08 miles or <500 ft.). Individual YOTO and their habitat could become crushed by equipment or disturb by the presence of equipment and personnel during the re-route construction. Alterations to rodent burrows, rocks, logs, or tree stumps used by the YOTO as refugia may increase the risk of predation, change microclimates which can affect growth and survival, and influence prey availability by changed the prey's habitat (Brown et al. 2009).

To mitigate the risk of disturbing or crushing any YOTO during the re-route construction, qualified personnel will survey the area just prior to starting the work and remain on-site during

implementation of the restorative and maintenance actions (See Section IV. Project Design Criteria). Because adult YOTO have been found to have site fidelity to burrows (Liang 2010), attention will be given to identify existing burrows and if possible they will be avoided. If YOTO are found within the area where the re-route will be constructed, their safety shall be assessed by qualified personnel and dealt with according to the Terms and Conditions described in the Programmatic BO (See Section IV. Conservation Measures; USDI 2014).

Harden Stream Crossing (19E01 @ Deer Creek): The approaches to Deer Creek would be hardened at Meadow 09N83-2 (Figure 1, Point V1) by adding large cobble and boulders (8-16" diameter) and the trail better defined with boulders to limit the width of the crossing on both sides of Deer Creek. The action of hardening the stream crossing at Deer Creek may affect YOTO if they were to occupy the streambanks during implementation and they could become crushed. A simple survey of the banks before equipment enters the area and rock placement occurs to ensure no YOTO are present in the area would help to mitigate this risk. If YOTO are found, individuals may be encouraged to move out of the danger zone without handling them. If this effort isn't successful, then their presence shall be dealt with according to the Terms and Conditions described in the Programmatic BO (USDI 2014) as described in Section IV. Conservation Measures and Project Design Criteria.

Stream Bank Restoration: Stream banks impacted by past off-trail vehicle travel would restored at three locations along Deer Creek (Figure 1, Points V2-V4) and one location along Blue Creek (Figure 1, Point V5) (Table 10). Each of these points are located within suitable YOTO wet meadow habitat. Techniques used to restore these sites would include seeding, willow cutting planting, and sod plug transplantation. YOTO present along the stream banks may be disturbed by the stream bank restoration activities, although injury and mortality are not expected. YOTO utilizing the bank areas at the time of implementation may be encouraged to move out of the area, or moved based on the Programmatic BO Terms and Conditions. Since the scope of implementing the stream bank restoration is minor, disturbance would be temporary and would not cause a lasting effect on YOTO behavior or persistence in the area. Furthermore, these restorative actions should result in bank stabilization and subsequently reduce the potential that future erosion and sedimentation would occur; indirectly improving the future water quality and stream conditions of Deer Creek and Blue Creek. Seeding and willow planting would also provide additional cover opportunities for YOTO.

Road Maintenance: Improving culvert function by installing catch basins, new culverts, and clearing out or upgrading undersized culverts in addition to re-grading the road surface, repairing rolling-dips, and adding gravel along steep sections of the roadway, are all actions expected to improve the existing condition of the meadows and streams along route 09N01. The maintenance actions may however, affect YOTO where they occur along the 0.07 miles traversing wet meadow habitat, and the 0.93 miles traversing upland habitat.

Actions occurring within a few feet of the edge of the road prism (i.e. re-grading, rolling dip repairs, and graveling) would not directly affect the YOTO wet meadow or upland habitat although individual YOTO may be affected. During their active season YOTO move among multiple habitats. Since Route 09N01 bisects suitable YOTO habitat, they may be, and have been observed directly on the route. Because toads move slowly and cannot easily avoid maintenance vehicles or equipment and because they are relatively small and hard to see they are difficult to avoid. Furthermore, because they have permeable skin, they are more susceptible to the toxic effects of chemicals from OHV or vehicles used for road maintenance (Andrews et al. 2008, USDI 2014). Adverse effects of pollutants such as vehicle emissions, oil and gas leaks or spills, may include reduced survival, growth, and effect metamorphosis, altered physiology and behaviors, deformities in tadpole oral cavities, and elevated levels of stress hormones.

YOTO present on the route during maintenance activities may be disturbed, injured, or killed. Road maintenance actions would also repair / modify sections that have standing water or water flowing over them. This should reduce the incidences of toads sitting in wet puddles on the road surface and lower the susceptibility to injury and mortality during future use of the route.

Actions associated with culvert repair or installation may also affect YOTO. YOTO juveniles and sub-adults have been observed at and near the culverts along Route 09N01. Culvert maintenance occurring at crossings of Meadow Creek, intermittent streams, or other ephemeral streams along Route 09N01 may disturb, injure or kill YOTO and cause increased stream turbidity or sedimentation downstream. Despite these potential effects, the functionality of the culverts and subsequently stream condition would be improved after completion of the work. Therefore, implementation of the proposed culvert maintenance is expected to improve the water quality of the aquatic habitats and would indirectly benefit YOTO utilizing the area.

To mitigate the risk of disturbing or crushing any YOTO during road maintenance and culvert repair or installation, qualified personnel will survey the area just prior to starting the work and remain on-site during project implementation. If YOTO are found, individuals may be encouraged to move out of the area of danger without handling them. If this effort isn't successful, their presence shall be dealt with according to the Terms and Conditions described in the Programmatic BO (USDI 2014).

Cumulative Effects

Under the Endangered Species Act, cumulative effects are "those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation". Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The spatial boundary for analyzing the cumulative effect of the reasonably certain State and private actions in combination with the effects of the proposed project activities occurred at the HUC 7 watershed scale. Three HUC 7 watersheds encompass the proposed project area; Blue Lakes, Meadow Creek, and Lower Deer Creek. Populations or individual LCT, SNYLF, and YOTO inhabiting these three watersheds are expected to remain within the watershed and therefore actions occurring outside the HUC 7 watersheds would have no measurable cumulative impact on LCT, SNYLF, YOTO or their habitats. Actions identified that are reasonably certain to occur are summarized in Table 11. The primary pathways considered in the cumulative effects analysis are 1) the potential risk of directly impacting (disturbance, injury, or mortality) individuals or their habitats, and 2) the risk of increased sedimentation in the habitats.

Table 11: A summary of the reasonably certain to occur State and private actions within the spatial extent of the cumulative effects analysis.

HUC7	Actions	
	Private	State
Blue Lakes	PG&E Hydroelectric Activities -Dam maintenance, reservoir and stream flow variations Recreation -Fishing, Developed Camping	CDFW Fish Stocking Species: LCT
Meadow Creek	PG&E Hydroelectric Activities -Dam maintenance, reservoir and stream flow variations Recreation -Fishing, Dispersed Camping	CDFW Fish Stocking Species: LCT
Lower Deer Creek[4]	NONE	NONE

[4]All of the lands are publically owned and administered by the Forest Service. As such, there would not be any State or private actions that that could occur.

PG&E Hydroelectric Activities

Routine Dam Maintenance*:* Maintenance is expected to be an ongoing process that not only involves routine items such as keeping the catch basins and spillways clear, but also regularly inspecting the structure. Dam maintenance actions could include the use of heavy, mechanized equipment such as cranes or small barges and divers to clean out floating debris, remove trees or brush from the embankment, remove sediment build-up at the spillway, mitigate erosion at the embankment and abutment, repair seepage, and seal cracks.

Lahontan Cutthroat Trout

Dam maintenance activities could cause a behavioral disturbance to LCT and lead to an increase in sedimentation downstream of the dam site being maintained. The actions proposed for the Deer Valley 4wd Meadow Restoration and Blue Lake Road Maintenance Project in the Blue Lake HUC7 watershed associated with Route 19E01 would occur greater than 1.0 mile downstream of the Lower Blue Lake dam. LCT potentially disturbed by re-opening Route 19E01, hardening the stream crossing at Deer Creek, or stream bank restoration actions, would not be directly affected or disturbed by dam maintenance actions occurring at the Lower Blue Lake Dam (or any of the other dams for that matter). Similarly, the project activities proposed to occur in the Meadow Creek HUC7 watershed associated with Route 09N01 would occur greater than 0.5 miles downstream of the Twin Lakes dam. Therefore, LCT potentially disturbed by re-opening Route 09N01 or culvert maintenance actions would not be directly affected or disturbed by dam maintenance actions occurring at the Twin Lake Dam. As such, there would not be any cumulative direct effects to LCT as a result of dam maintenance actions.

Dam maintenance actions could cause increased sedimentation and potentially incrementally cause a cumulative impact to the spawning habitat suitability for LCT below the stream crossings at Blue Creek and Deer Creek along Route 19E01 and in Meadow Creek along Route 09N01. Continued dam maintenance however, would provide long-term benefits to downstream LCT spawning habitat suitability by preventing catastrophic dam failures and maintaining proper function. The risk to LCT habitat from not maintaining the dams far outweighs the risk of causing increased downstream sedimentation by maintaining them.

Sierra Nevada Yellow-legged Frog

No dam maintenance actions are expected to directly affect SNYLF because SNLYF have never been found occupying the reservoirs. SNYLF disturbed, injured, or killed by re-opening or re-routing Route 19E01, hardening the stream crossing at Deer Creek, or stream bank restoration actions, would not be directly affected by dam maintenance actions because these actions would occur greater than 1.0 mile downstream of the nearest dam site (Lower Blue Lake dam). Similarly, SNYLF potentially disturbed by re-opening Route 09N01 or culvert maintenance would not be directly affected or disturbed by dam maintenance actions because these actions would occur greater than 0.5 miles downstream of the nearest dam (Twin Lakes dam). As such, there would not be any cumulative direct effects to SNYLF as a result of dam maintenance actions.

Dam maintenance actions may, however, cause increased sedimentation in the creeks located downstream of where the maintenance actions are occurring and potentially incrementally cause a cumulative impact to the habitat suitability for SNYLF. Continued dam maintenance however, would provide long-term benefits to downstream SNYLF habitat suitability by preventing catastrophic dam failures and maintaining proper function. The risk to SNYLF habitat from not maintaining the dams far outweighs the risk of causing increased downstream sedimentation by maintaining them.

Yosemite Toad

No dam maintenance actions are expected to directly affect YOTO because YOTO have never been found occupying habitats directly adjacent to the dams at Upper Blue Lake, Lower Blue Lake, Twin Lake, or Meadow Lake. YOTO disturbed, injured, or killed by re-opening or re-routing Route 19E01, hardening the stream crossing at Deer Creek, or stream bank restoration actions, would not be directly affected by dam maintenance actions because these actions would occur greater than 1.0 mile downstream of the nearest dam site (Lower Blue Lake dam). As such, there would not be any cumulative direct effects to YOTO as a result of dam maintenance actions.

Although dam maintenance actions may cause increased sedimentation in the creeks located downstream of where the maintenance actions are occurring, because these streams are not typically preferred YOTO breeding habitat, there would be little to no measurable impact to this species. Indirectly however, dam maintenance would provide long-term benefits to YOTO by preventing catastrophic dam failures and maintaining proper function. Significant introductions of sediment to the streams running through and adjacent to suitable and Proposed Critical wet meadow and upland habitat could make the streams more susceptible to bank erosion and meadow sloughing. Both of which, could lead to de-watering of wet meadow YOTO breeding habitat. Maintaining the dams would help to reduce the likelihood that habitat altering loads of sediment would enter into the stream.

Regulated Stream Flow Release*:* Stream flow variations are expected to occur on a seasonal and annual basis as well as during routine maintenance actions.

Lahontan Cutthroat Trout

LCT utilizing the stream / creek habitats located below the dams are susceptible to unnatural flow patterns and unpredictable variations in depth, clarity, and availability. A significant reduction in flow may; 1) displace LCT, 2) lead to their demise if they are left stranded out of water, 3) increase water temperatures, 4) create dispersal barriers, or 5) delay the streams ability to move fine sediment through the system. These 5 potential effects of stream flow variations could exacerbate the potential effects (i.e. behavioral disturbance, increased sedimentation) of the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project. Although, because the magnitude of the behavioral disturbances and increased sedimentation that may occur as a result of this Project are expected to be minor and short lived, any incremental or detrimental effect caused by unnatural stream flow variations would become unmeasurable within a year.

Sierra Nevada Yellow-Legged Frog

SNYLF potentially utilizing the stream / creek habitats located below the dams are susceptible to unnatural flow patterns and unpredictable variations in depth, clarity, and availability. A significant reduction in flow may; 1) reduce pool volume, 2) increase water temperatures, 3) expose aquatic refuge, 4) cause egg mass desiccation, or 5) delay the streams ability to move fine sediment through the system. The potential effects of stream flow variations could exacerbate the effects of possible increased sedimentation caused by the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project. Because, however, the magnitude of increased sedimentation that may occur as a result of this Project are expected to be minor and short lived. Therefore, any incremental or detrimental effect to SNYLF habitat suitability caused by unnatural stream flow variations would become unmeasurable within a year.

Yosemite Toad

In contrast to LCT and SNYLF, YOTO are less susceptible to unnatural flow patterns and unpredictable variations in depth, clarity, and availability because YOTO are less dependent on stream habitat. If YOTO utilized a stream habitat (as they are known to occasionally do), their

utilization would most likely occur during the non-breeding season. Although, streams do not provide ideal YOTO breeding habitat, a stream may provide foraging and refuge habitat. Unnatural flow patterns may both negatively and positively affect the foraging and refuge suitability of stream habitat. For instance, while a significant reduction in flow may affect the availability of prey it may also make prey more accessible or expose additional refuge opportunities.

Recreation

Recreational activities can result in disturbance, injury, or mortality to LCT, SNYLF, and YOTO and to their habitats. Meadows, ponds, lakes, and streams are attractive places to recreate. Hikers and their pets, fisherman, packstock, OHV, may disturb, injure, or kill individuals of all life history stages. These activities that occur near high elevation meadows, lakes, and streams can result in increases in pool sediments, modification to pool morphology, vegetation disturbance, bank trampling, and erosion. At high elevations, riparian habitats tend to be sensitive to disturbance because the vegetation growing season is short.

***Fishing**:* Fishing is a common activity occurring in the reservoirs and streams located on the Private land within the Blue Creek and Meadow Creek HUC7 watersheds.

Lahontan Cutthroat Trout

Fishing directly affects LCT as they are likely to be disturbed, injured, killed, or consumed by this activity. It is assumed that the majority of the fishing occurs within the reservoirs and sparingly or intermittently in the creeks below them. Although fishing LCT may affect the population sizes seasonally and annually, new LCT are stocked in the reservoirs yearly. Since these reservoirs are actively stocked and stocking is expected to continue into the future, fishing in these habitats is not expected to cumulatively result in a change in LCT presence downstream (in the vicinity of Project activities).

Sierra Nevada Yellow-Legged Frog

The activity of fishing may cause behavioral modifications in potentially present SNYLF but it is not expected to result in the injury or mortality of individuals. Unless, however, a fisherman decided to catch a SNYLF and use it for bait. It is assumed that the majority of the fishing occurs within the reservoirs and sparingly or intermittently in the creeks below them.

Yosemite Toad

Fishing may cause behavioral modifications where YOTO are present in the vicinity of where fishing is occurring but it is not expected to result in the injury or mortality of individuals. Fisherman walking through meadows or along the banks of streams may cause soil compaction, bank trampling, and erosion, or disturb or step on individuals.

***Developed and Dispersed Camping**:* Camping is a common activity occurring in the Blue Creek and Meadow Creek HUC7 watersheds. Although the presence of campers in the area may disturb LCT, SNYLF, and YOTO, the effect of this disturbance is expected to be localized and isolated to the area the camping is occurring. Therefore, no camping on State or Private land would cumulatively affect LCT, SNYLF, or YOTO potentially present or its habitat in the Project area on FS land.

CDFW Fish Stocking

The fish stocking occurring in Upper Blue Lake, Lower Blue Lake, Twin Lake, Meadow Lake, Granite Lake, and Evergreen Lake are sustaining LCT presence in the area. If the stocking was not occurring, LCT would not be present in the reservoirs or the creeks located in the Project areas (Blue Creek, Deer Creek, and Meadow Creek). While there are no anticipated effects of

stocking LCT *to* LCT, other than increasing the likelihood of presence in the project area, as long as fish continue to be stocked in reservoirs and lakes in the vicinity of the project area, the likelihood of SNYLF occupancy is very minimal. Furthermore, because YOTO are unpalatable to fish, there too, are no anticipated effects of stocking LCT to YOTO.

VII. COMPLIANCE WITH MANAGEMENT DIRECTION

The proposed project is compliant with all relevant management direction. In particular:

Forest Service Manual (FSM);

#	Direction	Compliance
A1	Manage National Forest System lands so that the special protection measures provided under the Endangered Species Act will no longer be necessary, and threatened or endangered species will become de-listed.	Although the proposed project may affect the Threatened LCT and YOTO and the Endangered SNYLF protected under the Endangered Species Act the potential effects identified through this analysis are not expected to significantly affect the persistence of LCT or SNYLF. YOTO are at the greatest risk as a result of implementing this project. The proposed seasonal closure(is expected to significantly reduce the risk that YOTO will be injured or killed.

Eldorado National Forest Land Management Plan (USDA 1989);

#	Direction	Compliance
B1	Maintain and enhance populations of Threatened and Endangered wildlife and plant species and maintain viable populations of Sensitive Species.	See #A1.
B2	Provide a diverse habitat for all species	The proposed project activities would not modify the types of habitat available in the project are.
B3	Maintain and enhance plant and animal communities (including Threatened and Endangered species) in accordance with federal law, regional guidelines, and Forest needs.	See #A1.
B4	Provide cover and forage for wildlife species depended on meadows and the adjacent forest edge. Maintain the integrity of the meadow ecosystem.	Although the proposed project may affect cover and forage opportunities for the SNYLF and YOTO in meadow habitat temporarily during project implementation, the proposed corrective and restoration actions are expected to improve the availability of cover and foraging habitat along Routes 19E01 and 09N01. The corrective and restoration actions proposed along both Routes were designed to repair and maintain the integrity of the meadows in which they travel through.
B5	Utilize administrative measures to protect and improve Threatened, Endangered, Rare, and Sensitive wildlife species.	The proposed seasonal closure of Routes 19E01 and 09N01 was designed to protect the Threatened YOTO and Endangered SNYLF. Pre-implementation surveys would also be conducted to reduce the risk of project related disturbance or mortality. Implementation will either be delayed if species are present in the area or individuals will be relocated per the Terms and Conditions described in USDI FWS 2014.

Programmatic BO (USDI 2014);

Type	Direction	Compliance
General	1a. Wheeled vehicles off designated routes, trails, and limited off-highway (OHV) use will be prohibited to reduce the risk of crushing, injuring, or disturbing individuals of the listed species (per S&G 69).	Cross-country (off-designated route) travel would not be permissible in the project area. Cross-country travel would be enforcement by FS officials. Areas along Route 19E01 where previous cross-country travel has been identified would be blocked and the stream crossing at Deer Creek in meadow 9N83-2 would be delineated with boulders to limit the width of the crossing at both ends.
	1b. Within critical aquatic refuges, occupied habitats, or areas proposed as Critical Habitat, mitigation measures to avoid impacts to the 3 listed amphibians will be implemented for ground disturbing equipment to reduce the risk of killing individuals and adversely affecting their habitat (per S&G 109). The measures may include avoiding the activity all together.	To mitigate the risk of disturbing or crushing SNYLF or YOTO, qualified personnel would survey the areas where ground disturbing activities are planned to occur just prior to the start of the work. If either SNYLF or YOTO are found within the area, their safety shall be assessed by qualified personnel and dealt with according to the Terms and Conditions described in USDI FWS 2014. Since YOTO have high site fidelity to burrows, extra attention will be given to identity existing burrows and avoided.
	1e. The use of low velocity water pumps & screening devices for pumps (S&G 110) will be utilized during drafting for project treatments to prevent mortality of eggs, tadpoles, juveniles, & adult SNYLF & YOTO	Yes, see Design Criteria (Section IV.). The use of low velocity water pumps and screening devices for pumps (per S&G 110) will be utilized during drafting for project treatments to preventing mortality of eggs, tadpoles, juveniles, and adult SNYLF and YOTO. A drafting box measuring 2 feet on all sides covered in a maximum of 0.25 inch screening is required.
	1g. Fuels and other toxic materials will be stored outside of riparian conservation areas and critical aquatic refuges (per S&G 99) to limit the exposure of the listed species to the toxic materials associated with vegetation management activities.	This is standard practice as directed by S&G 99. There are no CARs in the project area. No fuel storage would take place within RCAs. Refueling would take place in RCAs only where there is no other alternative. Spill prevention and cleanup of hazardous materials would be implemented in accordance with FS timber sale type B contract clauses and in accordance with the Eldorado Hazardous Spill Notification and Response Plan. -

Type	Direction	Compliance
General Cont.	1h. If management activities are proposed in an RCA, site-specific mitigation measures will be designed to (1) minimize risk of sediment entry into aquatic systems and (2) minimize impacts to habitat for aquatic- and riparian-dependent species (per S&G 92).	Activities within RCAs were evaluated by the interdisciplinary team on-the-ground. Site specific measures to improve the condition of Routes 19E01 and 09N01 in meadow and stream crossings or sections of each Route traveling adjacent to meadows or streams were designed to minimize the risk of sediment delivery to aquatic and meadow habitat as described in the Proposed Actions. These actions include; 19E01 – streambank erosion rehabilitation (planting vegetation and/or sod plugs), hardening stream crossings, trail re-route and abandoned trail decommissioning, and trail delineation and 09N01 – construction of sediment catch basins at culverts, installation of new culverts, clearing existing culverts, graveling road surface, repair or installation of rolling dips, and linear grading of the road surface.
	1j. When a project results in riparian vegetation being outside the range of natural variability to an extent that the three listed amphibians and/or their habitats may be negatively affected, design criteria will be incorporated to mitigate effects or restore riparian vegetation to the natural range of variability during project implementation (per S&G 105).	Project activities will not alter riparian vegetation outside the range of natural variability. The actions proposed contain site-specific measures to re-vegetate the streambanks of Blue and Deer Creek in areas that have been damaged by past OHV use.
	1n. Management activities will not adversely affect water temperatures required for local species, including the three amphibian species (per S&G 96).	1. Changes in canopy cover provided by forest or riparian vegetation surrounding aquatic habitats can significantly affect water temperature. No actions proposed in this project are expected to alter the amount of shade on any water body because vegetation near aquatic features would not be removed. As a result, water temperatures would not be adversely affected by the actions proposed. 2. Taking No Action may affect water temperatures in a different manor because continued increases in sedimentation and erosion are expected if the actions proposed for this project are not implemented. Increased sedimentation may reduce pool volume and interrupt flow. Shallow, slow flowing streams would be warmer than a deeper, more swiftly flowing stream. The proposed actions are not expected to adversely affect water temperature
	1o. For projects that could adversely affect streams to the extent that the three listed amphibians and/or their habitats may be negative affected, and the streams are already outside the range of natural variability, mitigation measures and short-term restoration actions will be implemented to prevent declines and/or improve conditions. Long-term restoration actions will be evaluated and implemented according to priority (per S&G 102), which includes adverse impacts to listed species.	Site specific measures to improve the condition of Routes 19E01 and 09N01 at stream crossings or sections of each Route traveling adjacent to streams were designed to minimize the risk of sediment delivery to aquatic habitat as described in the Proposed Actions. These actions include; 19E01 – streambank erosion rehabilitation (planting vegetation and/or sod plugs), hardening stream crossings, trail re-route and abandoned trail decommissioning, trail delineation. 09N01 – construction of sediment catch basins at culverts, installation of new culverts, clearing existing culverts, graveling road surface, repair or installation of rolling dips, and linear grading of the road surface.
	1r. Corrective actions will be implemented when needed to restore hydrologic connectivity of aquatic systems that are disrupted by roads (per S&G 100). S&G 100 specifically states; Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. Implement corrective actions where necessary to restore connectivity	The road maintenance actions proposed for Route 09N01 were designed to restore the hydrologic connectivity of Meadow Creek and the meadows located along Route 09N01. After completion of the road maintenance actions along Route 09N01, the integrity of Meadow Creek and the other meadows intercepted by the route, will be restored. The hydrologic connectivity of Blue Creek, Deer Creek, and Meadows 9N83-1 and 9N83-2 is not disrupted by Route 19E01 therefore no corrective actions were specifically necessary to reach compliance with S&G 100.
	1t. Actions consistent with S&Gs and the desired conditions of aquatic habitats will be implemented after identifying and evaluating adverse effects of recreation-associated activities (per S&G 116). S&G 116 specifically states, Identify roads, trails, OHV trails and staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites during landscape analysis. Identify conditions that degrade water quality or habitat for aquatic and riparian-dependent species. At the project level, evaluate and consider actions to ensure consistency with standards and guidelines or desired conditions	S&G 116 was met during project planning. The proposed actions were developed to address impacts to aquatic and riparian habitat that are occurring from OHV use along Routes 19E01 and 09N01. The proposed restorative actions along Route 19E01 (trail re-route, hardening of the crossing at Deer Creek, and stream bank restoration) and the trail maintenance actions proposed along Route 09N01 were designed to ensure consistency with S&Gs and to improve the condition of the habitats affected by Routes 19E01 and 09N01.
Watershed Restoration	1a. Protection needs will be established with appropriate restrictions and mapped prior to commencement of operations (per BMP 1.4). This includes wetlands, meadows, lakes, springs, stream-course protection zone widths, etc.	Suitable SNYLF and YOTO habitats have been identified and mapped (See Figures 4 and 8). Design criteria associated with SNYLF and YOTO will be implemented in these mapped areas.
	1b. A limited operating period may be established to ensure that negative impacts to resources may be avoided; contract provisions can also be used to close down operations during adverse operating conditions (per BMP 1.5)	Although BMP 1.5 is associated with Timber Sales (contract clause c6.313) design criteria have been developed to limit the period of project implementation to ensure the lowest risk to YOTO and SNYLF. The use of ground-based mechanized / motorized vehicles or equipment to implement the restoration activities would not occur during the proposed seasonal closure for Routes 19E01 and 09N01 to limit impacts to YOTO and SNYLF (See Design Criteria, Section IV.).
	1h. Soil erosion will be minimized to protect water quality via the stabilizing influence of vegetation foliage and root networks. Surface-disturbed areas will be revegetated with grass or browse species between previously planted trees as needed for control of overland runoff and to meet wildlife needs (per BMP 5.4)	Site-specific streambank erosion rehabilitation (re-vegetation and/or sod plugs) is proposed to occur in areas previously impacted by OHV use.
	1w. Watersheds will be restored to repair degraded watershed conditions and improve water quality and soil stability. Watershed restoration is a corrective measure to improve ground cover density; improve infiltration; prevent excessive overland runoff and conserve the soil resource; stabilize stream banks and	- The actions proposed in this project (i.e. trail re-route, streambank restoration, stream crossing hardening, road maintenance, maintain/install catch basins at culverts, install new culverts where needed, gravel additions on steep route sections, rolling dip repair, re-grading the road, and clearing out/ upgrading undersized culverts within the specified alignment and grade tolerances) are designed as corrective and restoration actions.

Type	Direction	Compliance
	stream channels; improve soil productivity; reduce flood occurrence and flood damage; and improve overall watershed function (per BMP 7.1)	- Post project implementation we expect that a) Downstream water quality and soil stability would be improved by reducing the rate and occurrence of erosion and sedimentation, b) Ground cover density would be increased and streambanks stabilized at the streambank restoration areas through planting, c) Infiltration along Routes 19E01 and 09N01 would be improved by repairing rolling dips, and re-grading the road, d) Excessive overland runoff would be prevented through the maintenance, repair and installation of new culverts.
	1aa. Tractor operations will be limited in wetlands and meadows. In order to limit turbidity and sediment production resulting from compaction, rutting, runoff concentration, and subsequent erosion use of mechanical equipment will be excluded in wetland and meadows except for the purpose of restoring wetland and meadow functions. Sediment and other pollutants will be controlled from entering streamcourses. The application of this BMP will be mandatory on all vegetation-manipulation projects as prescribed in the environmental documentation (per BMP 5.3). Specific protection measures will be established for each area that could incur adverse water-quality impacts (per BMP 1.18).	Mechanical operations in wetlands and meadows would be avoided except during the implementation of corrective actions along Route 09N01 that are designed to result in compliance with S&G 100. However, if mechanized equipment travels off the hardened road surface in order to implement restoration work (such as the reroute, culvert installation, repair, or maintenances) these areas shall be surveyed for existing Yosemite toads and Sierra Nevada Yellow-Legged Frogs by qualified FS personnel just prior to starting work to avoid crushing. If either SNYLF or YOTO are found within the area, their safety shall be assessed by qualified personnel and dealt with according to the Terms and Conditions described in USDI FWS 2014.
Watershed Restoration Cont.	1ee. Adverse water-quality impacts associated with destruction, disturbance, or modification of wetlands will be avoided (per BMP 7.3). Factors that will be evaluated include, but are not limited to, water supply, water quality, recharge areas, functioning of the wetland during flood and storm events, flora and fauna, habitat diversity and stability, and hydrologic function of riparian areas.	The actions proposed for this project that may be implemented within meadow habitat were developed to make corrective or restorative actions to improve and maintain hydrologic and biologic function of that meadow system. None of the actions proposed would result in a "net loss" of wetland /meadow habitat. Instead, the actions are expected to increase the area of properly functioning meadow habitat and potentially increase wetland habitat down-slope of project implementation.
	1ff. A water quality monitoring plan will be part of an environmental document, a management plan, or a special use permit, or it will be developed in response to other needs to evaluate the implementation and effectiveness of a management prescription in protecting water quality (per BMP 7.6).	All sites will be monitored by a Forest Hydrologist and Road Engineer after project implementation. The need for a specific monitoring plan will be assessed by the Forest Hydrologist during the post implementation monitoring. A plan, if needed, would be developed at that time.
	1gg. Management by closure to seasonal, temporary, and permanent use will be used to exclude activities that could result in damages to either resources or improvements, including impaired water quality from roads and trails (per BMP 7.7). Closure to use will occur when the condition of the watershed must be protected to preclude adverse water-quality effects and adverse impacts to the listed amphibians (per BMP 1.5; per BMP 2.9).	The proposed seasonal closure for the portions of Routes 19E01 and 09N01 that are currently closed (see Section IV, Description of the Proposed Action is intended to prohibit OHV use during the period of the most likely overland movement of SNYLF and YOTO. This proposed seasonal closure would also benefit water quality because the Routes would have an opportunity to dry-out before use is opened to the public. Erosion and sedimentation would be less likely after the Routes have dried.
	1hh. For any new proposed action or activity that may affect water quality, the Forest Service will examine all past, present, and future activities in a sub-watershed that may have a cumulative effect to water quality and beneficial uses (uses specified in water quality standards for each water body or segment), including the three listed amphibians if present in the sub-watershed or downstream.	See Cumulative Effects in Section VI of this report.
Road and Trail Maintenance	2bThe Forest Service will minimize water, aquatic, and riparian resource disturbances that may affect individuals of the three amphibian species and related sediment production when constructing, reconstructing, or maintaining temporary and permanent water crossings (BMP 2.8). Specifications for stream crossing areas and design, construction/reconstruction of permanent and temporary crossings, as well as maintenance of these crossings included in 36 technical specifications listed in BMP 2.8 will be followed.	- Route 19E01 crosses Deer Creek at Meadow 9N83-2. Part of the actions proposed for this project include hardening the approaches at this stream crossing using large cobble and rock between 8-16" diameter and to use boulders to better define the Route and limit the width of the crossing on both sides of Deer Creek. These actions are intended to reduce erosion and sedimentation. - Several of the culverts associated with Route 09N01 would be repaired/replaced to allow passage for the 100-year flow event and any sediment and debris carried by the 100-year flow event. The new culverts or other structures would allow passage of aquatic dependent species. - All equipment would avoid entering or crossing into aquatic habitat to the extent possible during restoration activities associated with the hardening of the approaches or Route 19E01's stream crossing at Deer Creek (in Meadow 9N8302) and the culvert installation, repair, and maintenance on Route 09N01. - Where equipment travels off the hardened road surface or crosses through stream habitat for restoration work (such as the reroute, culvert installation, repair, or maintenance, or hardening stream approaches), the areas shall be surveyed for existing YOTO and SNYLF by qualified FS personnel just prior to starting work to avoid crushing. If either SNYLF or YOTO are found within the area, their safety shall be assessed by qualified personnel and dealt with according to the Terms and Conditions described in USDI FWS 2014-
	2c. Measures described in BMP 2.11 to prevent adverse effects from fuels, lubricants, cleaners, and other harmful materials on skin-respiring amphibians will be implemented.	Fuels and other toxic materials will be stored outside of riparian conservation areas (per S&G 99) to limit the exposure of the listed species to the toxic materials associated with vegetation management, road and trail improvements, and other restoration and corrective action activities.
	2d. To protect water quality during road maintenance and operations, 31 practices related to road inspection, maintenance planning, and operations will be implemented as appropriate based on local site conditions (per BMP 2.4).	All applicable BMPs will be followed. Post decision a road design package will be developed incorporating each applicable BMP and input from an Erosion Control Plan (if it is determined one is necessary). The final road package will be designed as a collaborative effort between the road engineers and hydrologist. The final road package and Erosion Control Plan would be in the project record prior to implementation of the project.
	2h. A project-specific erosion control plan will be developed to effectively limit and mitigate erosion and sedimentation from any ground-disturbing activities, through planning prior to commencement of project activity, and through project management and administration during project implementation (per BMP 2.13)	Engineering and hydrology personnel will determine the need for (see exemption categories listed in BMP2.13) an Erosion Control Plan post-decision but prior to the completion of the road package and implementation of any project actions. The ECP will be prepared to complement design and site-specific prescriptions. A detailed and accurate ECP will allow Forest Service staff to conduct efficient, meaningful inspections of ground-disturbing

Type	Direction	Compliance
		projects, and will provide a needed check to ensure that mitigation measures for addressing impacts from the activities are accurately communicated to field staff.
	2j. The effects to riparian and aquatic resources of creating, maintaining and using routes and areas for motorized off-highway vehicles (OHV) will be mitigated by OHV-specific BMPs designed for each individual project or batch.	The proposed seasonal road closure for the portions of Routes 19E01 and 09N01 that are currently closed (see Section IV, Description of the Proposed Action) is intended to prohibit OHV use during the period of the most likely overland movement of SNYLF and YOTO. These proposed seasonal closure would also benefit water quality because the Routes would have an opportunity to dry-out before use is opened to the public. Erosion and sedimentation would be less likely after the Routes have dried.
Road and Trail Maintenance Cont.	2k. OHV trails will be located to reduce the risk that sediment originating from designated trails and areas will enter watercourses and water bodies to minimize hydrologic connectivity, and by incorporating drainage structures into trail design to disperse concentrated runoff (per BMP 4.7.2).	- This project proposes to re-route Route 19E01 to move the Route away from areas of active streambank erosion while improving the angle of the approach to the existing stream crossing to reduce future streambank degradation. These actions are expected to reduce the hydrological connectivity and the re-routed portion would be designed to disperse concentrated runoff and properly drain. The old section of trail would be blocked off, decommissioned, and rehabilitated by planting with locally collected vegetation. -As proposed, this project would maintain/install catch basins at culverts, install new culverts where needed, add gravel on the steep sections of the roadway, repair rolling dips, re-grade the road, and clear out/ upgrade undersized culverts within the specified alignment and grade tolerances. These maintenance actions would bring Route 09N01 into compliance with S&G 100, minimize impacts to hydrologic connectivity, and improve the drainage structures along the Route to disperse runoff and reduce sedimentation.
	2l. The discharge of sediment into water bodies from OHV use will be minimized or prevented by implementing the appropriate techniques outlined in BMP 4.7.3 for crossing location, trail approaches to watercourses, and design and construction of watercourse crossings.	- Route 19E01 crosses Deer Creek at Meadow 9N83-2. Part of the actions proposed for this project include hardening the approaches at this stream crossing using large cobble and rock between 8-16" diameter and to use boulders to better define the Route and limit the width of the crossing on both sides of Deer Creek. These actions are intended to reduce erosion and sedimentation. - Several of the culverts associated with Route 09N01 that are impeding movement of surface water and ground water through the meadows would be repaired or replaced to allow passage for the 100-year flow event and any sediment and debris carried by the 100-year flow event.. The new culverts or other structures would allow passage of aquatic dependent species and water to move more freely through the meadows.
	2m. The discharge of sediment into water bodies will be minimized or prevented during construction, reconstruction, and realignment of OHV trails (per BMP 4.7.4).	-Excessive runoff and sediment from Route 09N01 that is currently entering multiple meadows would be greatly reduced by the proposed actions; a) construction of sediment catch basins at culverts, b) installation of new culverts, c) clearing sediment and debris out of culverts, d) placement of gravel on the road surface, e) repair and/or installation of of rolling dips, and linear grading of the road surface. -Erosion and sedimentation from Route 19E01 would be greatly reduced by the proposed actions; a) hardening the approaches to the Deer Creek crossing, d) realignment of the approach at Deer Creek associated with the proposed re-route.
	2n. OHV trails will be monitored to reduce the risk of sediment delivery to water, aquatic, and riparian resources by identifying watercourse crossings and OHV trail segments in need of maintenance, setting priorities for maintenance, and identifying OHV areas and trails that require closure and restoration (BMP 4.7.5).	- Routes 19E01 and 09N01 were monitored or surveyed by forest staff prior to the formulation of the proposed actions. Results from this monitoring and surveys helped to develop and identify the corrective and restorative actions needed in order to reduce sediment delivery to the aquatic and riparian resources. - Future implementation monitoring of the portions of Routes 19E01 and 09N01 currently closed will occur as described in the Eldorado National Forest Travel Management SEIS Settlement Agreement Monitoring Plan (2015). This monitoring will determine the effectiveness of the corrective and rehabilitative actions that would be implemented as a result of this project. It will be conducted twice a year, once at the opening of the route in the spring and once in the fall to determine if impacts continue to occur. -Monitoring of the sections of Routes 19E01 and 09N01 outside of the project area will be performed in accordance with the OHV Monitoring Plan described in the 2008 ENF Public Wheeled Motorized Travel Management Decision.

Type	Direction	Compliance
Road and Trail Maintenance Cont.	2p. The discharge of sediment into watercourses and water bodies will be minimized or prevented by permanently restoring OHV-damaged areas, watercourse crossings, and OHV trails no longer designated for use (per BMP 4.7.8).	The actions proposed in this project were identified and designed in accordance with BMP 4.7.8 and address the ten step Restoration of OHV-damaged Areas (USDA 2006); a. Identify the source of the problem – DONE; ID team visited Routes 19E01 and 09N01 and identified areas in need of corrective or restorative actions. b. Effectively close the area to OHV traffic – DONE as a result of the ENF Travel Management SEIS c. Reshape the land to its original contour – PROPOSED ACTION; re-grade road d. Disperse concentrated runoff – PROPOSED ACTION; repair rolling dips e. Prepare the seedbed – f. Planting or seeding – PROPOSED ACTION; streambank restoration would include planting native vegetation or sod plugs. g. Stabilize the surface – PROPOSED ACTION; stream crossing approach hardening, gravel additions on steep sections of routes h. Signing – PROPOSED ACTION; signs and maps displaying the seasonal closure areas would be posted on routes 19E01 and 09N01 i. Enforcement and Monitoring – A seasonal closure and the prohibition of cross-country travel would be enforced. Future implementation monitoring will be conducted to determine the effectiveness of the corrective and rehabilitative actions that would be implemented as a result of this project (as described in the Eldorado National Forest Travel Management SEIS Settlement Agreement Monitoring Plan (2015)). It will be conducted twice a year, once at the opening of the route in the spring and once in the fall to determine if impacts continue to occur. -Monitoring of the other sections of Routes 19E01 and 09N01 outside of the project area and actions will be performed in accordance with the OHV Monitoring Plan described in the 2008 ENF Public Wheeled Motorized Travel Management Decision.

VIII. DETERMINATION OF EFFECTS

Lahontan Cutthroat Trout

Although the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project has the potential to impact individual LCT and their habitat the risk of impact is considered to be low / minor. A low/minor effect is an effect caused by an action or actions that may cause a change to a resource or species but the change would be small and if measurable, it would cause a small and localized consequence. A minor impact would not cause a permanent impairment to a resource. The LCT occurring in the vicinity of the project area, are present due to the active fish stocking of 4 reservoirs: Upper Blue Lake, Lower Blue Lake, Twin Lake, Meadow Lake and two other naturally occurring lakes: Granite Lake and Evergreen Lake. Each of the reservoir lakes are dammed, and therefore, unless a spilling event occurs, the LCT are physically isolated from one another and generally from the proposed project area. Furthermore, the stream / creek habitats potentially available to LCT in the project area are not naturally flowing. Each of them have decreased and regulated stream flows and are occupied by non-native trout; attributes considered a major threat to LCT persistence. No LCT have been detected in Blue, Deer, or Meadow Creeks (the three creeks potentially affected by the proposed project). We suspect this lack of occupancy is due in large part to the decreased and regulated stream flows and non-native trout presence. Additionally, proposed project activities would potentially impact a very small proportion of the available (poorly suitable) LCT habitat in the project area: 2 perennial stream crossings and 4 unnamed intermittent stream crossings. The potential disturbance of a LCT would be isolated to these stream crossing locations. No LCT would be injured or killed as a result of the proposed project because, like other stream dwelling fish, LCT would be expected to flee the area (upstream or downstream) as a disturbance approaches (i.e. human presence, OHV) thereby avoiding direct contact with vehicles crossing the streams. Therefore, due to the lack of presence, low likelihood of future presence, poor habitat suitability, small /localized risks of disturbance, and the presence of non-native trout, the risks associated with re-opening Routes 19E01 and 09N01, re-routing Route 19E01, hardening the stream crossing of Route 19E01 at Deer Creek, Stream Bank Restoration, and road maintenance of Route 09N01 are minor. For these reasons, it is my determination that the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project ***may affect but is not likely to adversely affect the Lahontan Cutthroat Trout.***

Sierra Nevada Yellow-Legged Frog

Although the actions proposed by the Deer Valley 4WD Meadow Restoration and Blue Lake /Meadow Lake Road Maintenance Project may disturb, injure, or kill individual SNYLF or add increased sediment into their aquatic habitat the scope of these impacts are very limited (likelihood, scale, and duration). SNYLF have not been documented in the project area. The nearest known sighting is approximately 0.8 miles away. Potentially suitable habitat in the area is poor. The streams are not naturally flowing, contain fish, and are lacking deep water habitat. Proposed project activities directly overlap with or travel through a very small proportion of SNYLF habitat; 2 perennial stream crossings, 4 unnamed intermittent stream crossings, along 0.46 miles of upland habitat, and 0.43 miles of meadow habitat. Disturbance and the likelihood of injury or death would occur over short periods and be minimized by qualified FS personnel surveying for existing SNYLF just prior to implementation. For these reasons, it is my determination that the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project ***may affect but is not likely to adversely affect the Sierra Nevada yellow-legged frog.***

Proposed Critical Habitat: Sierra Nevada Yellow-Legged Frog

The potential effects of the proposed project activities do not differ between general suitable habitat and the habitat occurring within the Proposed CH boundary. The potential effects to SNYLF habitat identified in this analysis were associated with sedimentation. However, the corrective and restoration actions that would be implemented as part of this project would significantly reduce the rate of, or fully mitigate the risk of, sedimentation within the months to years following completion of the project and thus, indirectly improving the habitat suitability for SNYLF. For these reasons, it is my determination that the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project ***is not likely to result in the destruction or adverse modification of Proposed Critical Habitat for the Sierra Nevada yellow-legged frog.***

Yosemite Toad

Despite the expected effectiveness of the proposed seasonal closure on limiting the risk of re-opening Routes 19E01 and 09N01, the risk would not be fully mitigated. Toad stragglers and the potential for illegal motorized use outside of the seasonal closure could cause disturbance, injury, or mortality of YOTO to remain as potential risks. For these reasons, it is my determination that the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project ***may affect and is likely to adversely affect the Yosemite toad.***

Proposed Critical Habitat: Yosemite Toad

A very small portion of the proposed actions would occur within YOTO Proposed CH (Table 10). The only actions that would occur within Proposed CH would be the re-opening of Routes 19E01 and 09N01 and road maintenance actions along Route 09N01. Although both of these actions have the potential to affect PCEs of YOTO habitat including hydroperiod, refugia, foraging, overwintering habitat availability, and prey availability the magnitude and scale of the effects are minor and discountable. For these reasons, it is my determination that the Deer Valley 4WD Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project ***is not likely to result in the destruction or adverse modification of Proposed Critical Habitat for the Yosemite toad.***

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USDI FWS 2014. Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad. Signed on December 19, 2014.

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Wengert, G. 2008. Habitat Use, Home Range, and Movements of Mountain Yellow-legged Frogs (Rana muscosa) in Bean and Spanish Creeks on the Plumas National Forest. Final Report to the Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service. Sacramento, CA 32 pp.

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Zweifel, R.G. 1955. Ecology, distribution, and systematics of frogs of the *Rana boylii* group. University of California Publications in Zoology 54:207-292.

X. FIGURES

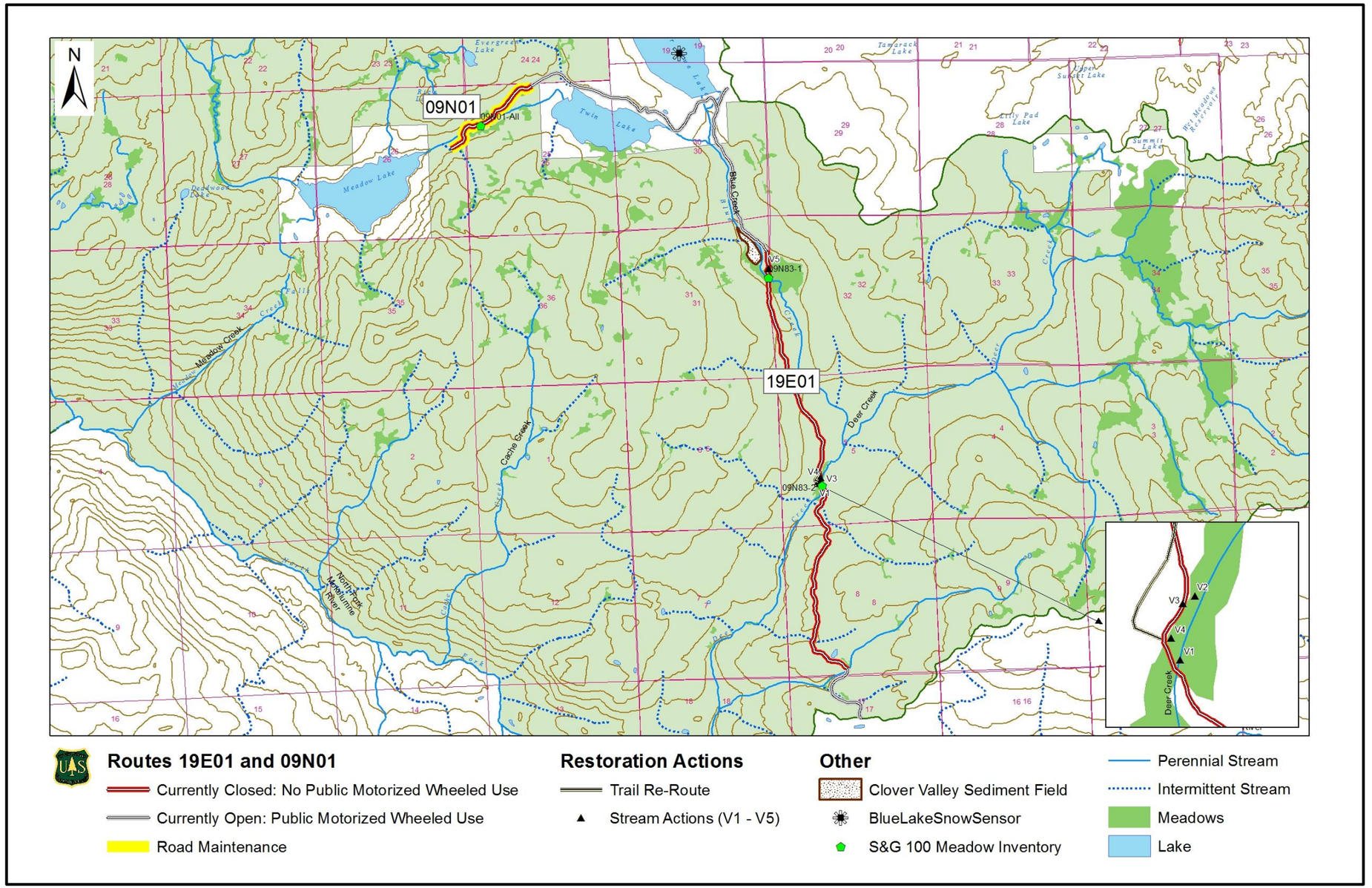


Figure 1: Deer Valley 4WD Trail Meadow Restoration and Blue Lake / Meadow Lake Road Maintenance Project proposed actions.

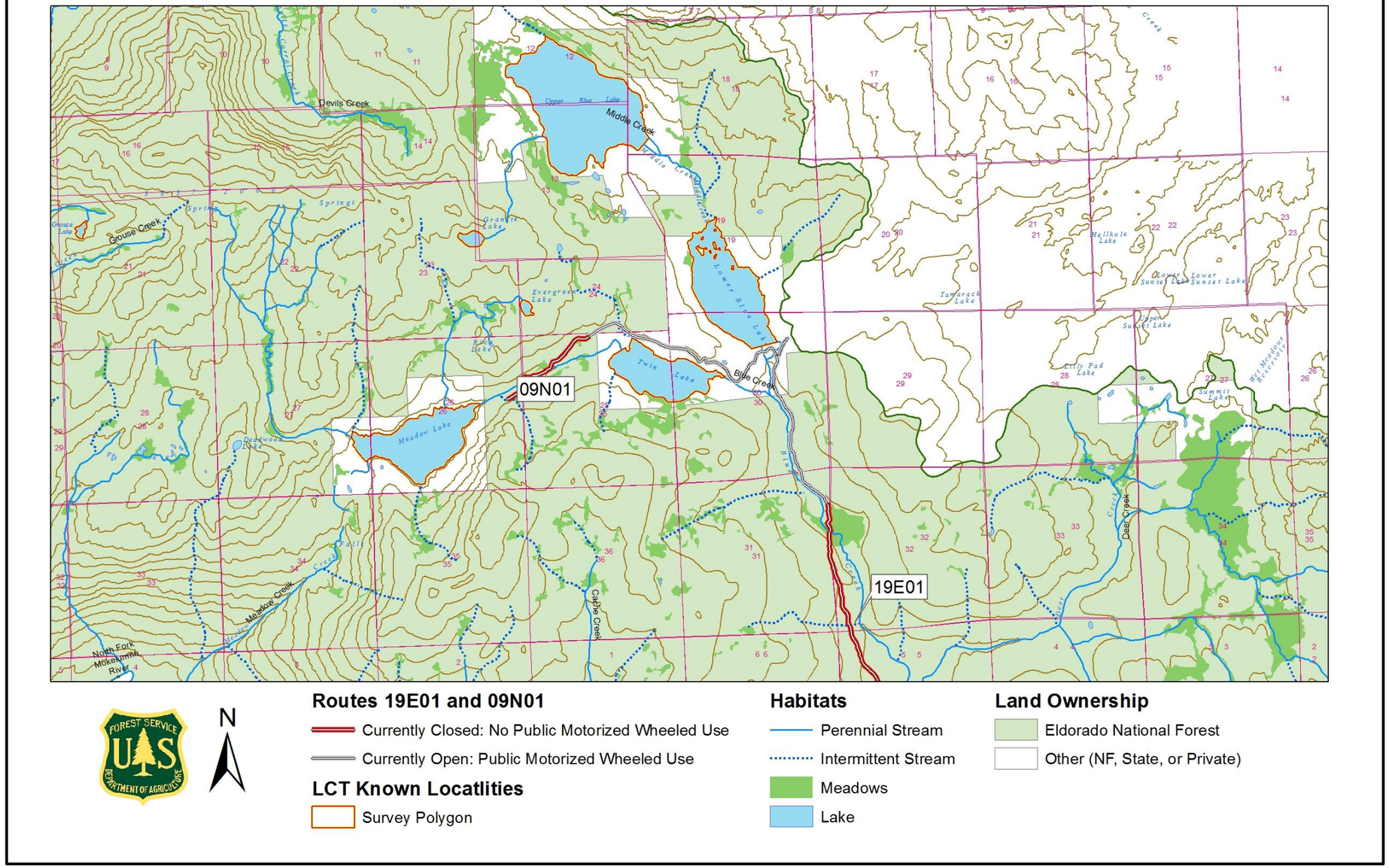
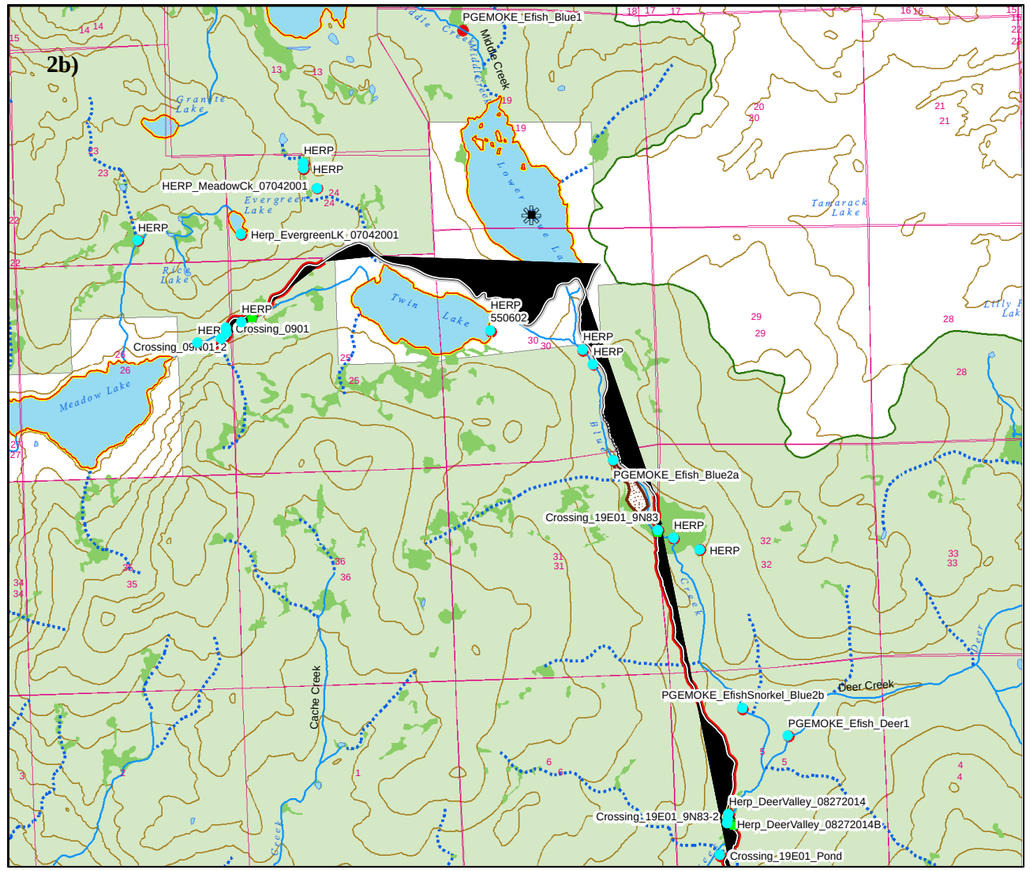


Figure 2: Lahontan Cutthroat Trout Eldorado National Forest known localities in the vicinity of the project area.



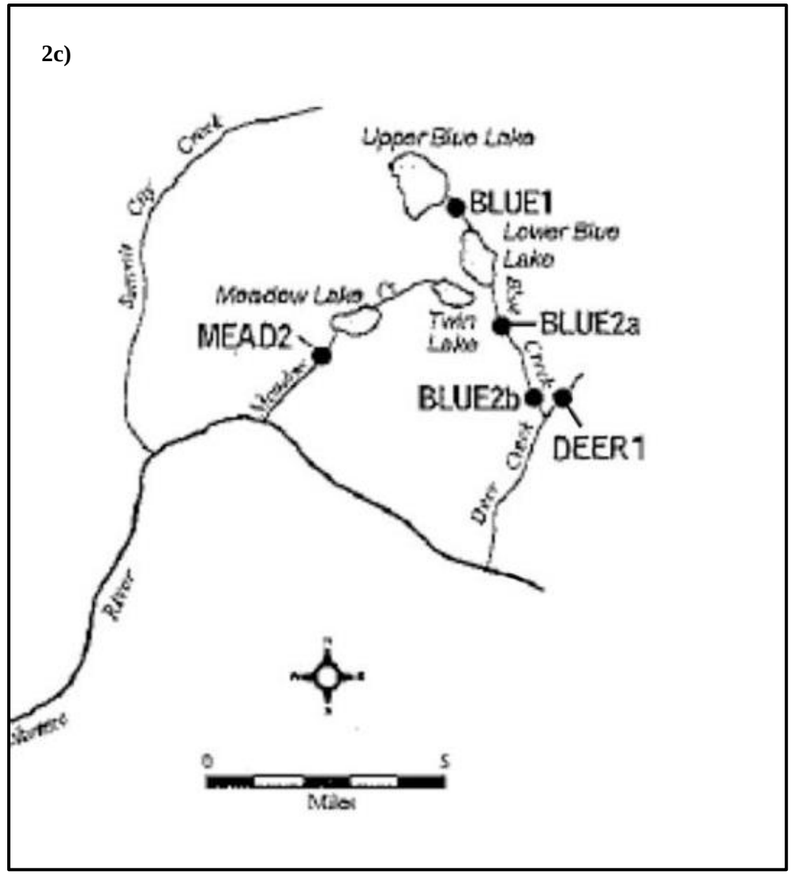


Figure 2b) Survey locations associated with Table 2b (pages 10 and 11) and Figure 2c) Survey locations associated with Table 2c (page 11).

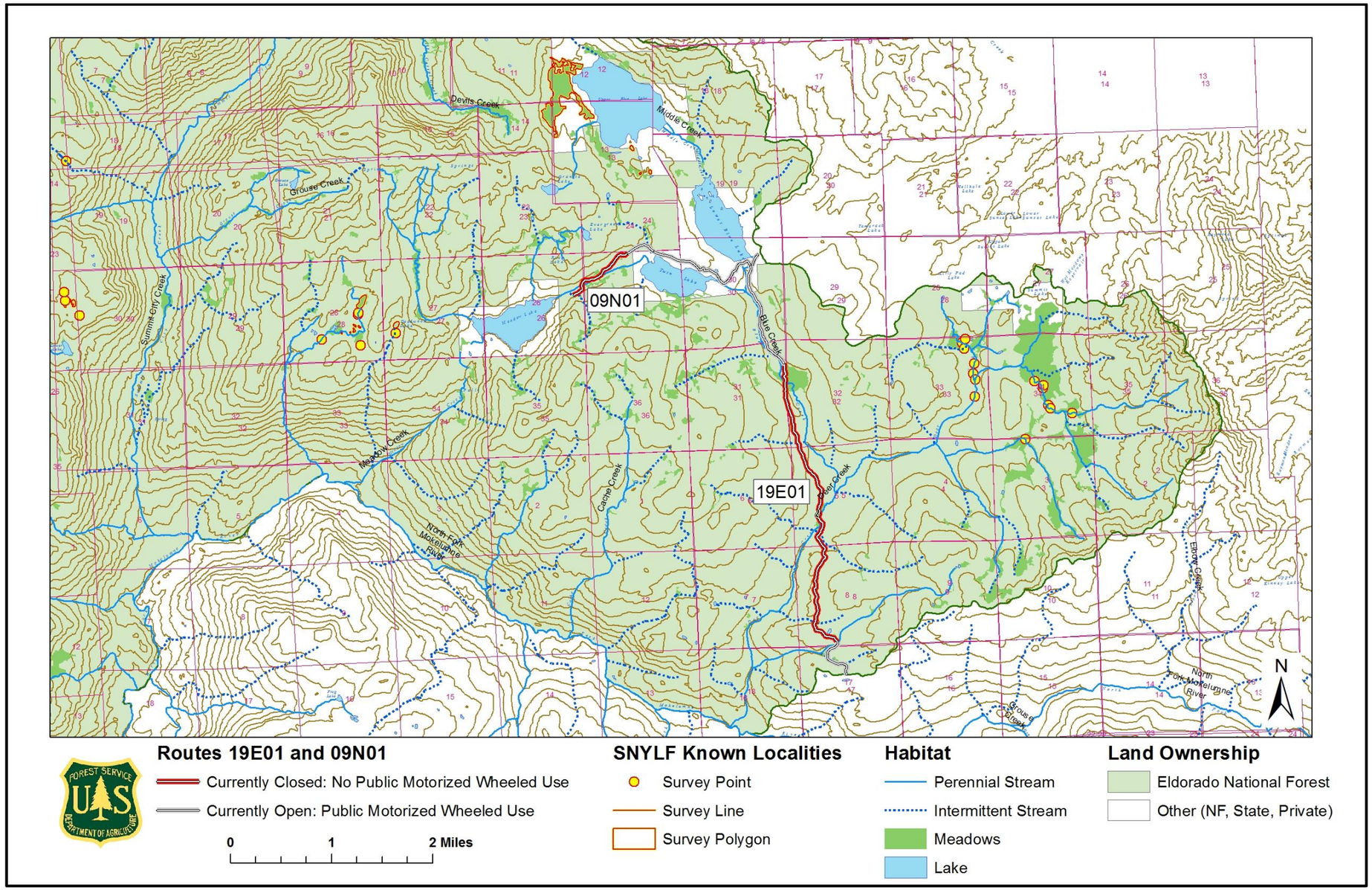


Figure 3: Sierra Nevada Yellow-Legged Frog Eldorado National Forest known localities in the vicinity of the project area.

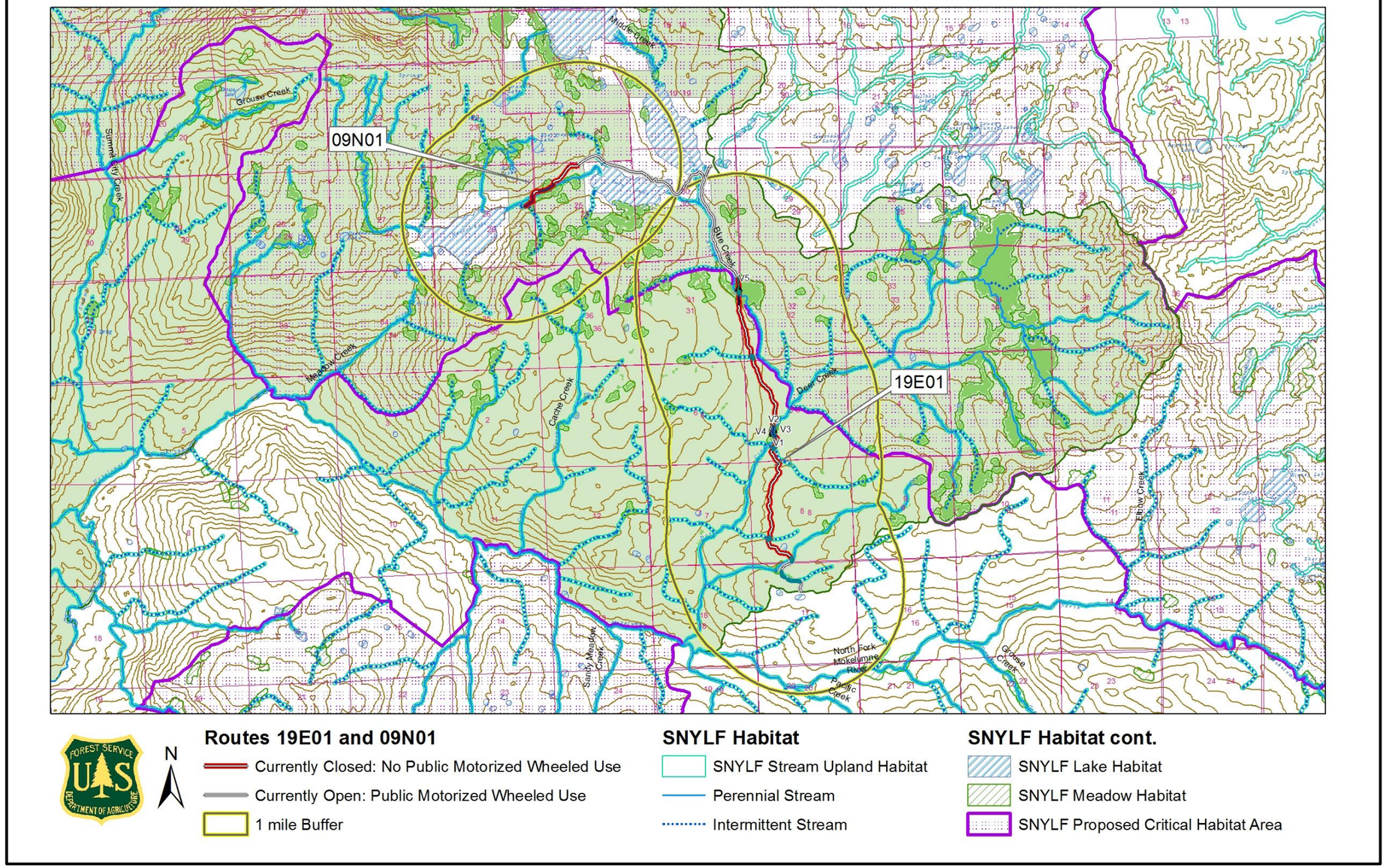


Figure 4: Sierra Nevada Yellow-Legged Frog Suitable and Proposed Critical Habitat.

Figure 5: Route 19E01 stream crossings at a) Blue Creek, and b) Deer Creek.

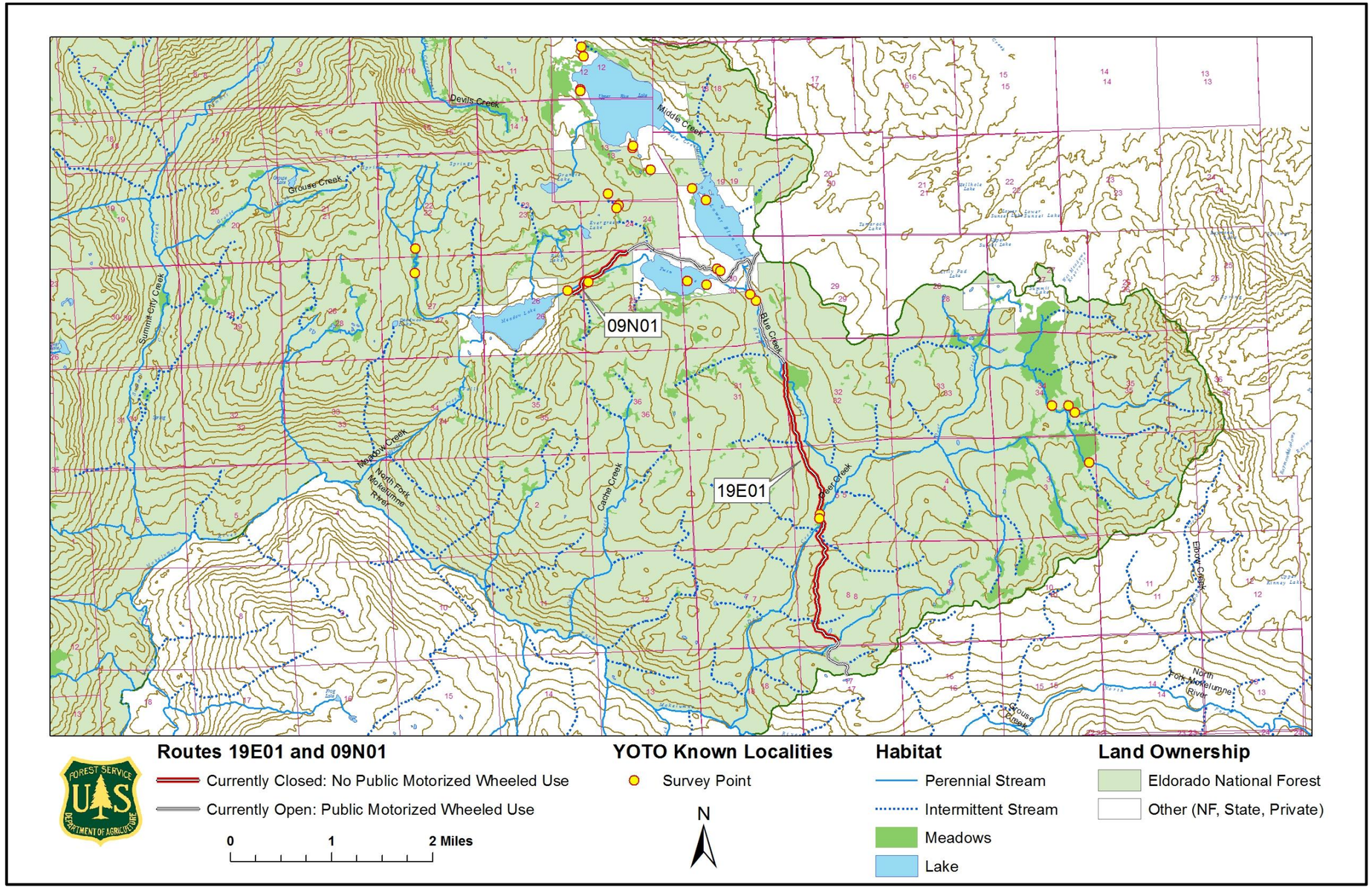


Figure 6: Yosemite Toad Eldorado National Forest known localities in the vicinity of the project area.

Figure 7: a) Photo of Yosemite toad hybrid observed on 8/27/2014 during a Deer Valley 4WD Trail (19E01) ID Team field trip to the proposed restoration sites. b) Photo of crushed YOTO

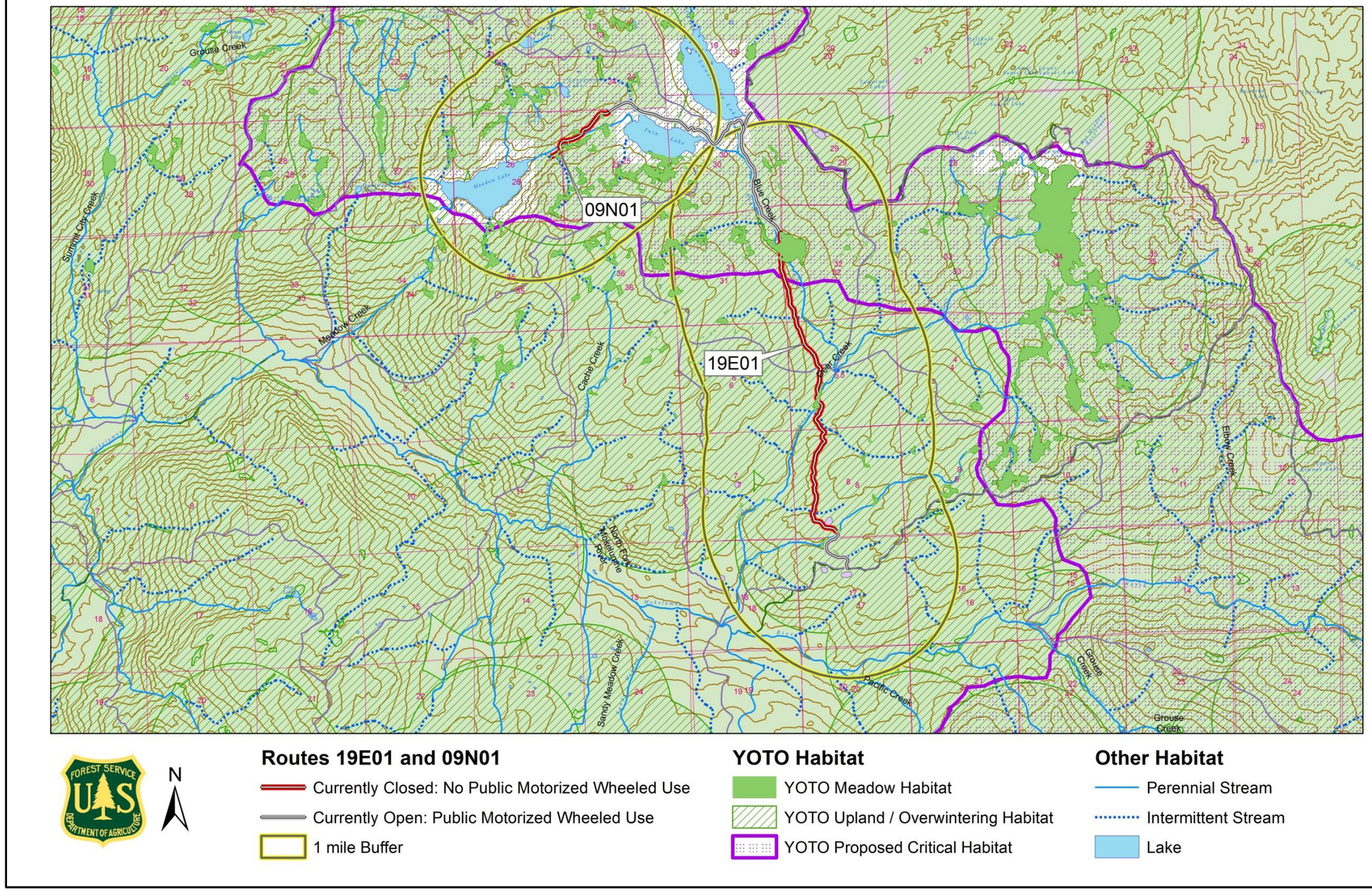


Figure 8: Yosemite Toad Suitable and Proposed Critical Habitat.

X. APPENDIX A

U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 150407083742

Current as of: April 7, 2015

Listed Species

Fish

Oncorhynchus (=Slamo) clarki henshawi

Lahontan Cutthroat Trout (T)

Amphibians

Rana sierrae

Sierra Nevada yellow legged frog (E)

Anaxyrous canorus

Yosemite toad (T)

Mammals

Martes pennanti

fisher (C)

Quads Containing Listed, Proposed or Candidate Species:

Pacific Valley (506C)

XI. APPENDIX B

Additional Project Design Criteria

- Should any TES species or watch list plant species be located associated with this project location district biology staff should be informed, and steps taken to evaluate, and mitigate any possible effects not covered by this assessment.
- A limited operating period (LOP) for northern goshawks (February 15 through September 15) would restrict restoration activities along a portion of the Deer Valley Trail that is located within ¼ mile of the goshawk nests, unless surveys confirm that goshawks are not nesting. The timing of the LOP would coincide with the hydrology design criteria for restoration activities taking place during a period of low stream flow.
- All off-road equipment would be cleaned to insure it is free of soil, seeds, vegetative matter or other debris that could contain seeds before entering the project area.
- Any straw or mulch used for erosion control would be certified weed-free. A certificate from the county of origin stating the material was inspected is required.
- Any revegetation material used for restoration or erosion control would be from a locally collected source.
- Infestations of noxious weeds that are discovered during project implementation would be documented and locations mapped. New sites would be reported to the Forest botanist.
- All gravel, fill, rock or other material would be weed free. Onsite sand, gravel, or rock would be used where possible.
- Known cultural resource sites will be flagged prior to work and avoided during implementation. There is to be no vehicle travel, vehicle or material staging, rock collection, or tree felling within the flagged areas.
- Should any previously unrecorded cultural resources be encountered during implementation of this project, all work should immediately cease in that area and the District Archaeologist be notified immediately. Work may resume after approval by the District Archaeologist; provided any recommended Standard Protection Measures are implemented.